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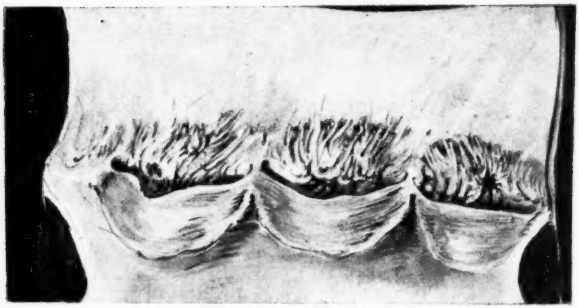
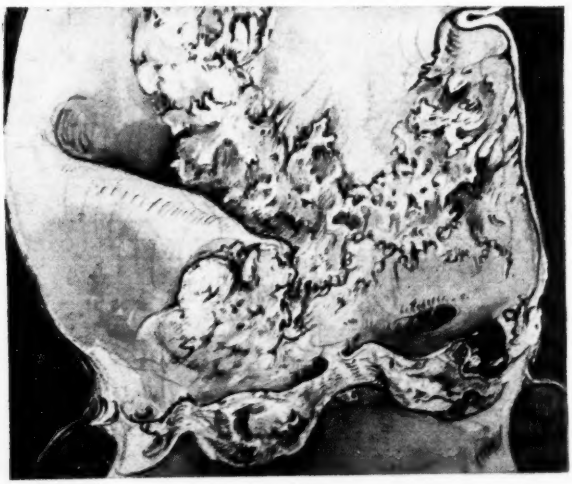
PLATE I.



Early aortic syphilis.

Aortic syphilis in an atheromatous subject.



Aortic atheroma.

[*Drawn by Miss D. Pillers.*

The Bristol Medico-Chirurgical Journal

"Scire est nescire, nisi id me
Scire alius sciret."

SPRING, 1926.

THE LONG FOX MEMORIAL LECTURE:

DELIVERED IN THE UNIVERSITY OF BRISTOL AT THE MEETING OF THE MEDICO-CHIRURGICAL SOCIETY ON DECEMBER 9TH, 1925.

THOMAS CARWARDINE, Esq., M.S., *in the Chair.*

BY

CAREY F. COOMBS, M.D., F.R.C.P. Lond.,

Physician (with charge of Out-patients), Bristol General Hospital;

ON

THE ÆTIOLOGY OF CARDIAC DISEASE.

I WAS never more surprised, and I think I can honestly add never more gratified, than when I heard that I had been chosen to deliver the Long Fox Lecture this year. It is true that a contemplation of the names of my predecessors, and of the lectures they have delivered, has filled me with a sense of my unfitness for so weighty a responsibility. Yet while such a responsibility is not assumed without a good many misgivings, these are outweighed by three considerations.

In the first place, I realise the kindly wish of my colleagues to recognise work done in Bristol, and this is a source of deep satisfaction. Let me therefore take this opportunity of thanking them for doing me so great an honour.

In the second place, it is also a pleasure to have an opportunity of paying a tribute to the memory of Dr. Long Fox. He died several years before I came to Bristol, so that I never saw him ; but his name was made familiar to me by my father, who had the greatest admiration for him. He used to come back from his visits to meetings in Bristol laden with fragments of wit and wisdom collected from his talks with Dr. Long Fox, and these he would retail to me with keen delight. Some years ago, also, he gave me a book by Dr. Long Fox, a volume on cerebral localisation, partly in print and partly in manuscript, and containing over fifty beautiful drawings of the brain. This book, which was a collection of observations made not for publication but for the pleasure of making it, was a product of that " student spirit " of which Sir Arthur Keith spoke not long ago, a spirit of ceaseless inquiry which, so far from being crushed by the routine of a heavy practice, discovers in that very routine the material on which it feeds and grows. His humility was the sign manual of the true student, and it is fitting that our school should do honour to itself, as well as to Edward Long Fox, by this commemoration of his name.

My third source of gratification at being elected to this lectureship is that it gives me an opportunity of saying with an added emphasis lent by this " brief authority " something of work which has been and is being, and will, I hope, continue to be done in the study of cardiac disease and its causation.

* * * *

PLATE II.

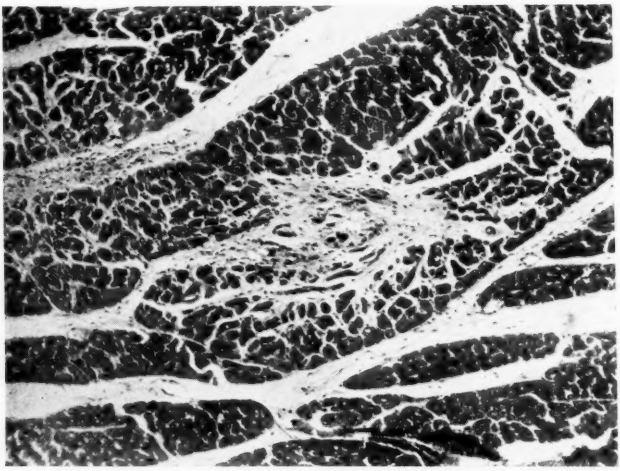


FIG. 1.

Submiliary nodule of acute cardiac rheumatism from wall of left ventricle.

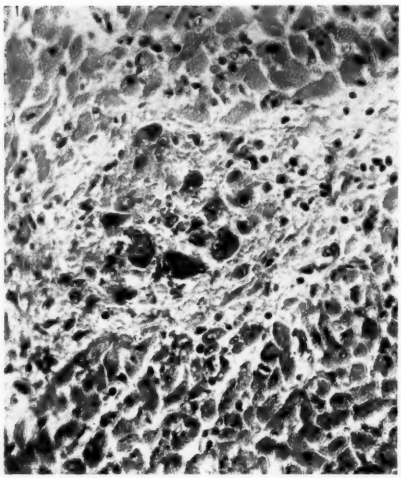


FIG. 2.

The endothelial origin of the large cells of the submiliary nodule is well seen.

FIG. 3.

Heart of rabbit showing a gross mitral endocarditis following inoculation with streptococcus fæcalis. Heart, cut longitudinally; mitral valve seen as dark mass at top.

In the time at my disposal little or nothing can be said of this work except in so far as it concerns the Bristol School. Yet I must find a moment in which to acknowledge the great debt that is due, not only from myself, but also from us all, to the St. Mary's School, for it is to the men of that School that we owe much of our present knowledge of rheumatic heart disease. One of the first, if not the first, to note the relation between rheumatism and heart disease was Edward Jenner, of Berkeley, but an appreciation of the extent of that relation has only gradually grown up.

TABLE I.

Ætiological Classification of Patients with Organic Disease of the Heart seen in

	Hospital Practice. Per cent.	*Private Practice.* Per cent.
Congenital	2·0	2·7
Rheumatic	51·0	25·0
Ulcerative endocarditis	10·6	7·6
Syphilitic	9·0	4·0
Cardiorenal	7·0	8·6
Senile	10·0	41·0
Alcoholic	1·4	2·5
Thyroid	4·0	2·7
Various	5·0	5·4

Table I. shows how large a share of the organic heart disease that we are called upon to treat is due to rheumatic infection. My own interest in the matter, begun at St. Mary's, found plenty to feed on in Bristol, and early in my investigations into rheumatic heart disease I was lucky enough to come across the intramyocardial lesion now known as the "submiliary nodule" or the "Aschoff body" (Fig. 1). Aschoff had given an account of it[1] a few months before we found it in Bristol, but I think we may claim priority

so far as a realisation of its ætiological importance is concerned. It was clear that if a lesion so distinct and striking were found constantly in rheumatic carditis, and not in other infections, we had gone a long way towards disposing of the idea, which still had some adherents, that this kind of carditis might be caused by all sorts of bacteria. Examination of hearts from persons dying of various kinds of infections showed that the submiliary nodule was a constant feature of active cardiac rheumatism, and as constantly absent from other infections. Next, it was found that in all rheumatic lesions, not only in those of the cardiac muscle, changes identical with those of the submiliary nodule were found. The essential features were those of a proliferative reaction, characterised especially by formation of giant cells, with a mild leucocytosis, on a background of fibrin. Foci of this kind are found not only in the myocardium, but also in the rheumatic valve, pericardium and joint, while the subcutaneous node, so characteristic of rheumatic infection, is only the submiliary nodule writ large. Thus we were able gradually to accumulate knowledge of the process of reaction to rheumatic infection, and to realise that the giant cells represented one phase in the reply of the vascular endothelia to the irritation inflicted on them by the rheumatic virus as it trickled through the small vessels (Fig. 2).

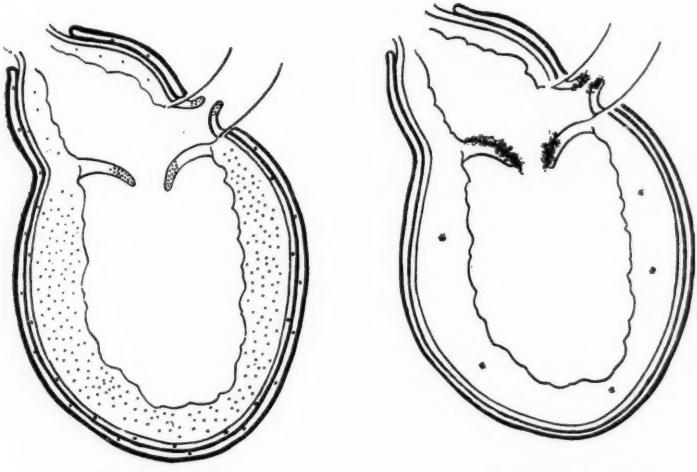
Obviously, however, the main interest lay in applying this test to reaction to experimental infections ; for the streptococcal view of rheumatism was, and still is, received only reluctantly and sceptically by most bacteriologists, in spite of the reasoned argument presented on its behalf by Poynton and Paine. Accordingly, material furnished by various experimenters was carefully examined, and this showed that

occasionally a reaction similar to that of clinical rheumatism might follow inoculation of animals with streptococci. Yet the cardiac lesions usually produced (Fig. 3) were less like those of rheumatism than those of another disease which began to be described and discussed at about that time, *i.e.* about 1908, the disease variously named chronic ulcerative endocarditis, subacute bacterial endocarditis, and endocarditis lenta. Moreover, it proved that this kind of endocarditis is practically always excited by streptococci ; that these streptococci belonged to the same cultural group as those normally found in the alimentary tract of man ; and that the rheumatic streptococci also belonged to this group as much as to any.

Why, then, should these streptococci become pathogenic at all ? And why should they cause sometimes one kind of cardiac lesion, sometimes another ? First of all, let us see what is the essential difference between these two kinds of cardiac infection. The answer is simple ; the one is a pancarditis, the other an endocarditis. As the diagram (Fig. 4) shows, the heart of rheumatic infection is attacked in all its parts at once, obviously through the coronary vessels and their ramifications ; while in ulcerative endocarditis the lesion is primarily and mainly one of the inner lining of the heart, the myocardium being injured only occasionally, either by direct extension therefrom or by embolism, while the pericardium never suffers. This kind of injury, it was surmised, was inflicted on the heart by organisms in the blood passing through its cavities ; a hypothesis which receives strong support from observations which Dr. Hadfield and I have recently made on the nature and distribution of the lesions found in the endocarditis of swine erysipelas. These lesions are very like those of ulcerative

endocarditis in man and also those of the inoculated rabbit, while the distribution of the causal bacilli—which appear to enter the circulation from the alimentary canal—leaves no doubt that they attack the heart from within its cavities and not from the coronary circulation.

Now, transferring all this to the case of the rabbit that has been inoculated with streptococci of the



Rheumatic carditis. Ulcerative endocarditis.

Fig. 4.
Distribution of Lesions.

rheumatic kind, or near akin to it, we find that the conception of an infection of the endocardium from within the cardiac cavities fits the facts. This is the kind of lesion that follows introduction of a large mass of streptococci into the circulation at one blow. And that is one reason, perhaps the chief reason, why these experiments have not generally provoked a cardiac lesion which faithfully imitates that of human rheumatism; the manner in which the organisms

enter the circulation, and therefore the heart, is different. We do not know exactly how the infection gets into the circulation in human rheumatism, but we may surmise that it is not in the form of a single massive dose.

If we look again for a moment at the experimental lesions we shall find that something more than injection of a large dose of organisms into the circulation is required if an endocarditis is to be set up; for if this were all, every such experiment would provoke an endocardial lesion. This is far from being the case. A majority, varying in the hands of different workers, fails to excite any cardiac lesion. Evidently it is necessary that certain conditions favouring infections should also be satisfied. And a little consideration suggests that this is true of the endocarditis lenta of man. It is very unlikely that every breach of the alimentary or bronchial mucous membranes admits streptococci that succeed in infecting the endocardium; for endocardial lesions of this kind, though commoner than we used to think, are nevertheless rare. I suppose there are not more than ten or twenty cases in a year in Bristol; yet the surface of mucous membrane that always lies exposed to the assaults of these bacteria must be at least as large as that of the ground covered by these University buildings. Now, it is ridiculous to suppose that such an area as this is not penetrated thousands of times a year by streptococci. Clearly, then, we have a parallel here with the experiments; many inoculations, but few endocardial infections. And in this case we know more of the conditions favouring endocardial infection than we do in that of the rabbits. In the first place, we know that old endocardial faults, whether developmental or acquired, invite new endocardial infections. Again, it was

shown by Starling and myself, as well as by observers in France and Germany, that endocarditis lenta was unduly prevalent after the war, that the increased incidence fell wholly on ex-service men, and particularly on men of first-class physique and morale; on men, that is to say, exposed to an ordeal of fatigue such as is rarely laid on human shoulders in these days, an experience sufficiently abnormal to alter radically the biochemistry of the body. It appears, then, that in such cases as these the environment has more power in determining whether or no the valve shall be infected than the micro-organism itself has.

Let us now return to the other kind of streptococcal infection, namely, cardiac rheumatism. That the organism is at all events similar to those of the normal alimentary tract is, I believe, admitted by everyone who supports the streptococcal hypothesis of rheumatic infection. Further, tonsillitis so often precedes an outbreak of rheumatic symptoms that it is safe to assume that the infective agent may enter in this way. Perhaps, also, it uses the lymphoid tissue of the small intestine as a means of ingress. Vining[2] has brought forward clinical evidence in support of this view, and in Price's *System of Medicine* Sir Thomas Horder[3] remarks that Dr. Mervyn Gordon "demonstrated to him an enormous quantitative increase in the Gram-positive cocci lying in the lymphoid tissue of the lower part of the ileum in two or three fatal cases of rheumatic fever." Here again, however, we must admit that if it were merely a question of an organism and a breach of mucous membrane everyone would be rheumatic. There must be other conditions, on the satisfaction of which the infection depends for its success. First among these is age.

About two-thirds of patients with cardiac

rheumatism are first attacked between the ages of five and fifteen. At this age the growing child is learning immunity against his alimentary saprophytes. (Watch a little Arab on the banks of the Tigris, and you will see the same kind of thing going on. His small hand scoops up a handful of water, infected in every conceivable way, which he drinks with impunity ; for it is the size of his hand that determines the size of the dose. It is like the old story of Milo and the calf ; his strength grows with the burden that tests it.) But during that decade something happens to the rheumatic subject which disturbs the proportion between the size of the child and the number, or virulence, of the alimentary streptococci that he has to contain. What is that something ? Of the local factors that may play a part we know next to nothing, and by no means enough about the general conditions favouring a breakdown in immunisation. There is a hereditary factor discoverable in about 50 per cent. of cases carefully investigated. Whether there is a racial predisposition is not known ; it is a disease of temperate zones, but probably climate rather than race determines this distribution. With one possible exception that we have not yet explored, the lower animals do not appear to be liable to anything identical with the rheumatic infection of humans.

There is a definite seasonal variation in the incidence of rheumatic infection. The curve obtained from the Bristol mortality records of 1876–1913 (Fig. 5) (examined with the invaluable help of Dr. D. S. Davies, his chief clerk, Mr. W. N. Brown, and a grant from the Colston Research Society) shows a winter elevation and a summer depression. This same series of observations[4] brought out a most interesting point : to wit, that the rheumatic rate in Bristol fell when the urban

populations were, so to speak, diluted by the addition to the city of semi-rural districts. Whether it is true that rheumatism is in general a disease of urban rather than rural communities is, however, not yet proven, and I hope researches in this direction may soon be initiated on an adequate scale. It is usually regarded as a poverty disease, as witness the contrast between its prevalence in the elementary schools and its almost entire absence from the big Public

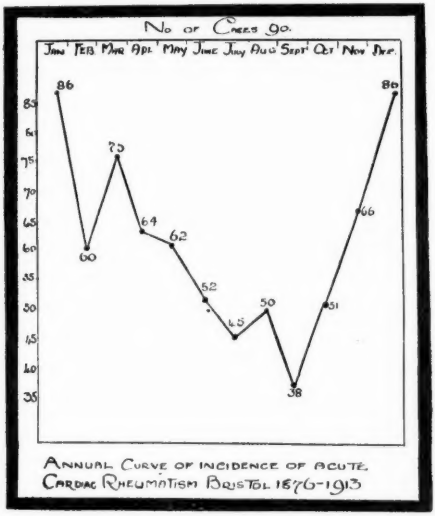


Fig. 5.

Schools. You will notice also that it bulks twice as large in hospital as in private practice. In the Bristol investigations there was some evidence connecting this disease with overcrowding, but Coates and Thomas,[5] working in Bath, have been unable to substantiate the view that the rheumatism of childhood is a poverty disease. What they did find, however, was that the incidence was definitely influenced by elevation. The disease was more likely to occur

in houses on alluvial soil, that is to say, in houses lying low and near to waterways. This agrees with Langmead's[6] experiences in London and Thomson's[7] in Birmingham. My Bristol map was rather against this view, except that it might have been interpreted as showing a high incidence in the slope of Clifton Wood overlooking the Avon. Drs. Askins and Morrison are now occupied in a very careful investigation of the homes of rheumatic children in Bristol, and we shall look forward to the outcome of their researches. Similar inquiries are in progress in other cities, partly under the auspices of the Medical Research Council, partly in reply to questions asked by a Sub-Committee of the British Medical Association, the Secretary of which, Dr. Reginald Miller,[8] himself published, some time ago, data in support of the view that in Paddington the house of the rheumatic child is a damp house.

Remarking, in passing, that our Bristol data gave no support at all to the view that rheumatism is a disease which haunts certain houses, I must now return from these rather controversial aspects to a summary of what appears established, namely that age, heredity, geography, season and perhaps an economic factor, conspire to break down the immunity of the individual against his alimentary streptococci; and that, just as this is a definite and constant combination of circumstances, so there issues from that combination a definite and stereotyped disease of the heart. That a disease which depends so much for its production on a combination of various circumstances should be separated from its neighbours by a kind of no-man's-land rather than by a sharp boundary will surprise no one; what is surprising is that time after time these conditions should so well agree as to cause a disease the histology of which is so constant and

individual. And it is because we cannot yet imitate these conditions in experiments that we have so far failed to provoke, by inoculations with the appropriate streptococci, a pancarditis similar to that observed in man.

The accompanying table may serve to summarise what has been said of these streptococcal infections of the heart.

Table II.

In man streptococci, probably alimentary, may enter the circulation and infect the heart, either—

Inevitably.	Accidentally.
Under certain specific conditions of age, heredity, geography, season, etc.	By finding unusual predisposing conditions, general or local.
They enter by the coronary vessels.	They attack from the blood circulating through the cardiac cavities.
The whole heart—valves, muscle and pericardium—is attacked. The histological pattern is constant and distinctive.	The endocardium is attacked first. The myocardium may be subsequently and secondarily attacked, either by direct extension or by embolism.
The valve is injured from within outwards.	The valve is injured from without inwards.
The only lesions at all resembling these rheumatic lesions in their intracardiac distribution are those of syphilis.	The lesions are like those of other forms of human ulcerative endocarditis (*e.g.* pneumococcal); the endocarditis of swine erysipelas; and most of the cardiac lesions caused by inoculation of animals with non-hæmolytic streptococci.

Next let us consider briefly the lesions of that other pancarditic infection, cardiac syphilis; and I believe that even here, where we are dealing with micro-organisms of great vigour and individuality, we shall find that the influence of circumstances is clearly discernible. Of the 39 patients included in my series who were suffering from this disease we may exclude 2 on the ground that the syphilitic origin of the lesions was not conclusively proven. Of the remaining 37 all but 4 were men, the average age was 53, and the period between infection and onset of cardiac symptoms—so far as this was ascertained—over twenty years. The symptoms of cardio-aortic syphilis are, in fact, contemporary with those of the parasyphilides of the central nervous system. In both we have the same question to answer: why are the results of infection so tardy in declaring themselves? The spirochætes are there, in the doomed tissues, within a few days or weeks of the primary infection. It is only a partial answer to say that the survival of spirochætes in certain localities is an example of the survival of the fittest. Why should it be these tissues alone that they are able to damage? The distribution of parasyphilitic lesions within the central nervous system has been explained by saying that they are due, not to syphilis alone, but to syphilis aided by the catabolic influence of fatigue. In the distribution of the cardiac lesions, also, there is more than a hint of a similar ætiology. It is on the first part of the aorta, its valves, its coronary branches and the muscle that they feed that the brunt of the syphilitic attack falls; on parts of the cardiac apparatus, that is to say, that are also directly exposed to the stresses set up by physical toil. About 90 per cent. of my patients were men, and this agrees closely with the experience

of others. This fact also appears to me to favour the view that physical stress predisposes to the evolution of spirochætal lesions in the cardio-aortic area. The ages of my patients ranged from 38 to 66; from an age some years anterior to that at which the vessels become grossly degenerate, well on into the normal period of decrescence. Atheroma and syphilis of the aorta may overlap each other at this period, as the pictures, made by Miss Pillers from specimens kindly lent by Dr. Hadfield, show (coloured plate).

Several years ago Drs. Waldo and Herapath[9] published an account of a case of complete heart block due to syphilis. The auriculo-ventricular bundle was destroyed throughout by what may be described as a descending degeneration, with similar but less advanced changes in the sinu-auricular node. The difference between this and the gummatous lesion usually responsible for syphilitic heart block is very like that subsisting between syphilitic myelitis and tabes dorsalis. The one is anatomical, the other physiological in distribution; and this physiological distribution follows what may be called the restless tracts of the organ concerned. It is an illustration of the familiar ætiological principle that when two injurious agencies attack any organ or tissue simultaneously they do more hurt, or, at all events, succeed more readily in doing it, than does either of them acting alone.

The same principle also finds expression in that group of maladies that has been collectively entitled "the senile heart." In everyone a deterioration of arterial and cardiac tissue sets in somewhere about the age of 35 or 40. This deterioration, you will remember, Metchnikoff laid to the charge of the bacteria in the large intestine. If this view be true, life is one long struggle against the parasitic inhabitants of the

alimentary canal; the first part of it successful, in so far as the body is capable of learning the art of immunisation, that is to say, of turning to account the *élan vital* with which it is endowed; the second half doomed to gradual declension as that vital force ebbs and leaves us more and more at the mercy of the enemy within our gates. At all events, explain it how you will, the broad fact is true: from forty onwards the cardio-vascular system is wearing out. The rate of this decline is a resultant of many factors. First comes the influence of heredity. This shows up so strongly in some cases, that it is probably the most powerful of all the agencies that determine the capacity of the circulatory pump to endure. For example, in one family whose history was reported by Dr. Lucas and myself the father died suddenly at the age of 47, and of his sons one was getting anginal pain at 39, while two others died suddenly, each at the age of 32. We made a post-mortem examination of one of these, and found in the coronary arteries and the root of the aorta atheromatous changes of the kind usually found in old people. This record is interesting, not merely because it shows how strong the influence of heredity may be, but also because it suggests that that influence may bear, in certain families, on certain particular parts of their cardio-vascular apparatus. Other examples of this are found in the familial liability to cerebral hemorrhage that is often observed; and in Dr. Herapath's discovery,[10] in two brothers, of progressive interferences with auriculo-ventricular conductivity complicating rheumatic heart disease. This is remarkable, because lesions of conductivity are rare in this disease, and when they do occur they are usually transient.

But the fate of the circulatory pump does not

depend only on the kind of material which it inherits. Throughout life it is exposed to assaults of all kinds; gross mechanical stresses on the one hand, and toxic influences on the other. Among the mechanical factors it is difficult to know whether to assign a place to a life of laborious muscular effort. You will notice that the senile heart group accounts for over 40 per cent. of the private patients and only 10 per cent. of the hospital ones; yet this series included far more labouring men than that did. Too much must not be made of this antithesis, but my own experience has been that cardiac breakdown at and after sixty is the fate of the sedentary rather than of the manual worker. Nor can it be shown that a persistently rapid beat wears out the heart. The cardiac changes that ensue upon protracted thyroid intoxication are directly due to the action of toxic substances on the cardiac muscle, and not to the wearing effect of continued tachycardia. That rapid beating does not of itself cause the heart to degenerate is proved by the fact that patients with the irritable heart syndrome that we saw on so large a scale during and after the war do not develop premature myocardial decay.[11]

On the other hand, there is no denying that the heart's reserves are wasted by hyperpiesia, the continued high tension that is apparently "idiopathic." In a series of patients with cardio-sclerosis but no signs of renal disease the arterial tension was persistently high in 40 per cent. While it must be admitted that the distinction between renal hyperpiesis and essential hyperpiesia may eventually prove to be artificial, there is no doubt whatever as to the very large part played by high tension, however it may be caused, in forcing the heart into bankruptcy.

On the other hand, too much has been made of the

mechanical burden laid on the senescent heart by chronic pulmonary disease. Yet of the toxic influences that may spell ruin to the myocardium one of the most potent and prevalent is the action of bacterial poisons generated by persistent respiratory infections. That this should be so is not surprising. The action on the myocardium of pneumococcus toxin in large doses is familiar, and it is only to be expected that the same poison, administered in small doses but over a long period, should work havoc of a less devastating but more permanent character. In a number of elderly patients with chronic pulmonary infections the influence of bacterial toxins on the cardiac muscle has been quite unmistakable, one of the most striking proofs of the relation being furnished by the improvement in the state of the heart which may follow an abatement of the pulmonary infection.

Another possible relation between infection and myocardial breakdown in later life is illustrated by a case which Dr. Hadfield and I are publishing.[12] A man of 49, the subject of syphilitic aortitis, died in the midst of an attack of lobar pneumonia. Post-mortem the descending branch of his left coronary artery was found to be completely closed by thrombosis and a large area of the ventricular wall had become necrotic. Gross coronary thrombosis is not very rare, and in recent years a number of papers have been written about it, especially by American physicians. (See also recent papers by Gibson[13] and McNee.[14]) In the course of a discussion on the subject Professor Francis Fraser made the very interesting suggestion that often cardiac failure in elderly men is the outcome of a series of coronary thromboses, only the grossest of which are appreciable as such clinically. There is a certain amount of anatomical evidence in

support of this proposition, which, if read in conjunction with the signs of an infective process, such as fever and pericardial friction, which often appear during the establishment of a coronary obstruction, adds a wider significance to the case we are reporting. Here there is no doubt that an acute infection, pneumonia, precipitated the deposition of clot in arteries already damaged by syphilis; and it is not improbable that many of the coronary thromboses in elderly men are the outcome of some new infection operating in a vessel whose endothelial continuity was already broken. If this is so, it seems that even in the deterioration of cardiac muscle that is the common lot of man after middle life the toxins of bacteria may play a threefold part. It is perhaps through their action on tissues whose vitality is decreasing that arteries, and therefore cardiac muscle, become old; toxins derived from bacteria in the respiratory tract may also make a direct attack on the impoverished myocardium; and by a similar agency the coronary vessels may become suddenly occluded, to the undoing of a heart already weary of its task.

And on that note I must make an end of this short summary. I wish it might have been rounded off with a comparison between the lesions of the greater or systemic circuit and those of the lesser or pulmonary circuit which a group of us has been studying; but this demands a separate report. When it appears, it will, I think, support the thesis that the present address has preached, namely that diseases of the heart arise, not from single causes only, but from conspiracies of causes. It is not the seed alone that matters, but also the soil and the weather. This, the critic may say, is so obvious that there was no need to spend an hour over it. But I am sure that we do need to think of cardiac disease in terms of causes.

More and more we are being driven back on ætiology as we see more and more clearly that the hope of advance lies in prevention rather than in cure. Yet the movement towards an ætiological view of cardiac disease has scarcely begun, if we are to judge from the kind of headings that still appear in the books. The subject-matter is still classified almost wholly in terms of morbid anatomy and physiology, hardly ever in terms of ætiology. Neither in our chief systems of medicine, nor in our popular text-books, nor even in recent manuals on heart disease will you find a paragraph on rheumatic heart disease as such, the subject being dealt with in scraps under all sorts of headings, such as mitral stenosis, pericarditis and so forth. The subject of cardiac syphilis fares no better; yet how are we to look for success in treatment if we are not taught to recognise the perfectly definite clinical picture furnished by this disease? In all sincerity I hope the work we are doing in Bristol will help to bring order into this desperate chaos, and I must therefore thank you once more for giving me this opportunity of enlisting your interest in our studies.

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SUPRARENAL VIRILISM.

WITH AN ACCOUNT OF A CASE.

BY

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INTRODUCTION.

WE cannot afford to ignore, as physicians or citizens, the biological attributes of sex in the study of behaviour, achievement or disease. The biological sciences, borrowing many facts from medical and pathological experience, have established a few fundamental principles of great value in the study of primary and secondary sex-differentiation, and in the light of these principles our knowledge of disease accompanied by altered sex characters is rapidly enlarging, whilst in others an alteration in the mechanisms which determine sex-differentiation is being recognised as a causative factor.

The case here reported illustrates the part played by the hormone of the suprarenal cortex in the establishment and maintenance of the secondary sex characters, a relation which has been made clear, chiefly by, what is now, the commonplace observation

that an excess of functioning suprarenal cortex in girls, women and boys is associated with the development of male secondary characters.

The sexual fate of the individual human being is normally determined at the moment of fertilisation, such primary sex-differentiation being apparently entirely due to the number, variety and arrangement of the chromosomes in the conjugation-nucleus of the ovum. The first trace of sex-differentiation is seen in the gonad, which appears early in embryonic life. Following this differentiation the gonads produce hormones which regulate all subsequent secondary sex characters; once primary sex-differentiation is accomplished secondary sex-differentiation is handed over entirely to hormonic control. Thus, castration in infancy in either sex leads to the regression of sex characters towards a neuter type, and, if followed by implantation of a gonad of the opposite sex, the characters of the sex of the implanted gonad appear. It thus follows that each sex contains in its cells the factors for the secondary sex characters of the other sex.

Other hormones influence or act with those of the gonads. For instance, under-action of the anterior lobe of the pituitary is associated with diminution in development and function of the genital system, with a tendency in males to assume the female physique. Hypothyroidism may be associated with early maturity in girls; and excess of the hormone secreted by the cortex of the suprarenal is, in girls and women before the menopause, associated with the development of male secondary characteristics.

This association between overgrowth or tumour formation of the suprarenal cortex and virilism is very striking. No such reactions arise from tumours of

the medulla of the gland, which are neuro-blastomata, occur in young male children, and produce extensive metastases, often in the skull bones. The cortical tumours may be congenital, when they are bilateral and hyperplastic ; or acquired, when they are unilateral and neoplastic. Of female pseudo-hermaphrodites 15 per cent. have bilateral cortical hyperplasia. Unilateral new growths (suprarenal hypernephromata) produce alterations in secondary sex characters, almost invariably, in girls, whose voice, physique and hirsuties approximate to the male type, whilst hypertrophy of the clitoris is very common. In women before the menopause half the cases of suprarenal cortical tumour produce virilism. Although similar tumours have been described in men, it is doubtful whether they are ever associated with alterations in secondary sex characters. Yet in boys the association is invariably present, producing the " infant Hercules " type.

There is no sharp line of demarcation between the congenital bilateral hyperplasias of the gland and the acquired unilateral cortical new growths, both of which are so often associated with virilism. The case we describe is almost certainly an example of congenital bilateral hyperplasia of the suprarenal cortex, producing abnormalities in sexual characters of the hormonic, pseudo-hermaphrodite type.

Case Report.

History.—A rather withered old woman of 70 years was admitted to the Southmead Hospital acutely ill from the effects of acute intestinal obstruction. She had a surprisingly deep voice and her face was covered by a stubbly beard of strong black hair, definitely situated in the masculine beard area. She had been ill off and on for several weeks, and it was later found that she had been lately catheterised several

times for retention of urine. Considerable abnormality was found in the external genital organs and, although the patient was very reticent, she said she had never menstruated, the abnormality had always been present, and she had had no trouble with micturition, except during the last few weeks. A huge tumour filled the left loin and a smaller mass was felt in the right. These she had not noticed except for a few months before admission. Her symptoms of obstruction were of a few days' duration only. In all respects her physique conformed to the masculine type, the development of the breasts was rudimentary, the shape and development of the bony pelvis and the disposition of fat and pubic hair of the male type. An operation to relieve the obstruction was undertaken immediately, but she died on the following day.

EXTRACTS FROM POST-MORTEM RECORD.

External Genital Organs.—The mons veneris and labia majora were small, the nymphæ absent. The clitoris was greatly hypertrophied, 4 in. in length and had a well-marked glans. Its under surface was grooved along its whole length, the groove leading to a female type of urethral opening.

Internal Genital Organs.—The uterus was ill-developed and rudimentary. It was $2\frac{1}{4}$ in. long, and its wall nowhere thicker than $\frac{1}{4}$ in. The fundus was not developed, the cavity roomy and not constricted in the cervical portion. The arbor vitæ uteri was well marked, and occupied the lower two-thirds of the internal surface. Continuous with the uterus was a thin-walled vagina hardly admitting the forefinger above and becoming conical below, where it opened to the exterior by a small orifice just admitting a probe and lying immediately behind that of the urethra. The broad ligaments were thin, the Fallopian tubes small and fragile, but their fimbriated ends were well formed. A slender round ligament was present. Both ovaries were present but small and fibrotic, and no active ovarian tissue was found in them on section nor any indication that they had ever been the site of ovulation.

Urinary Organs.—The clitoris was continuous, with well-formed corpora cavernosa and spongiosa. At the base of the bladder and investing the urethra were two small lateral and one larger mesial mass, which on section had a structure identical with that of the male prostate. The mesial mass projected $\frac{3}{4}$ in. into a thick-walled bladder, forming a dome-shaped swelling about 1 in. in diameter at its base which was obstructing the internal urethral orifice. Histologically its

glandular tissue was hyperplastic, and many tubules showed dilatation and papillary projection of their epithelium similar to the change found in senile hypertrophy in males.

A systematic search was made for testicular tissue ; none was found.

PATHOLOGICAL EXAMINATION OF SUPRARENAL TUMOURS.

The left loin was filled by a large tumour mass, $7\frac{1}{2}$ in. long by $6\frac{1}{2}$ in. broad by 4 in. thick, irregularly lobulated, not unduly adherent and non-infiltrating. Occupying the site of the right suprarenal and partially filling that loin was another large mass of the same naked-eye appearance and consistency, measuring $4\frac{1}{2}$ in. by 3 in. by 3 in., but in shape roughly preserving the form of the normal suprarenal.

Both tumours on section were extremely greasy. The larger showed irregular lobulation and considerable old and recent interstitial hemorrhage. The lobules, roughly ovoid, about $1\frac{1}{2}$ in. long by $\frac{3}{4}$ in. broad, and devoid of any naked-eye pattern, were separated from each other by broad branching, ashy-grey bands and fasciculi, which formed a wide-meshed network originating in a surface layer of the same tissue constituting an external capsule for the tumour. The lobules were found to be composed of hemorrhagic fat. The capsule and its interlobular branches were composed of tumour tissue.

The capsule of the tumour on the right side was thicker and more uniform, and for a distance of 2 to 3 in. from the lower pole it had the typical colour and naked-eye appearance of normal suprarenal cortex, giving the impression of a suprarenal gland greatly distended by a central new formation over which the cortex was tightly stretched. The kidney below this tumour was normal and not infiltrated. The left kidney showed no naked-eye abnormality.

Microscopic Examination.—A large fraction of the bulk of the tumour was composed of hemorrhagic fat, the tumour tissue being confined to the capsule and its interlobular branches. The tumour tissue was well preserved at the surface, but large tracts in the central portion were necrotic and autolysing. The capsule and its branches were composed of tissue which closely copied, in structure and, in some places, in arrangement, the cortex of the normal suprarenal. Where the capsule was thick, especially in the case of the smaller tumour, the resemblance to the zona glomerulosa was very striking. The interlobular septa were composed of sheets, columns, and masses of cells of the same appearance as, and directly

PLATE III.

(*a*) FIG. 1. (*b*)

External genital organs.

L.—Atrophied labia.
C.—Hypertrophied clitoris.
G.—Groove in clitoris.
U.—Urethral orifice.

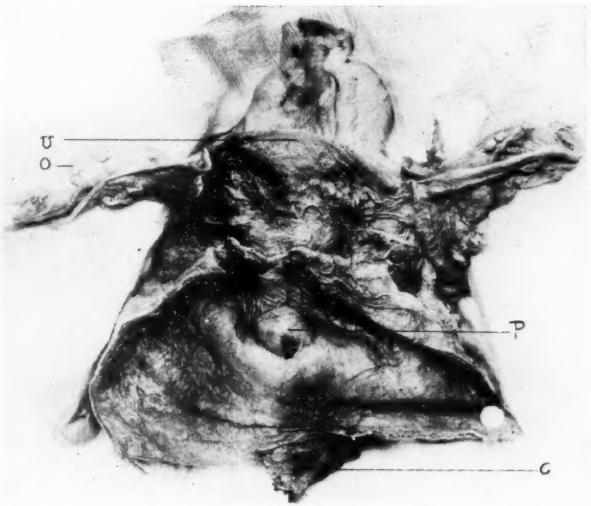


FIG. 2.

Internal genital organs.

P.—Prostate. C.—Clitoris with probe in urethra. U.—Uterus. O.—Ovary

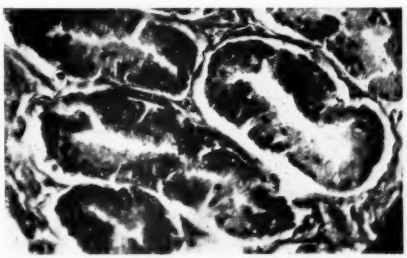


FIG. 3

Micro-photograph of section of prostate.

Note resemblance to gland in "senile hypertrophy" in males.

PLATE IV.

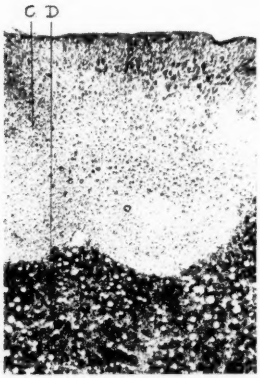
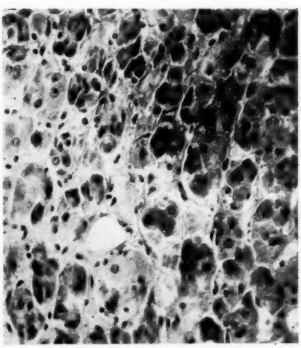


FIG. 4.—*A very low-power view of the surface of the tumour.*

C.—Capsule of supra-renal cortex.
D.—Sarcomatous-looking tissue embedded in fat.

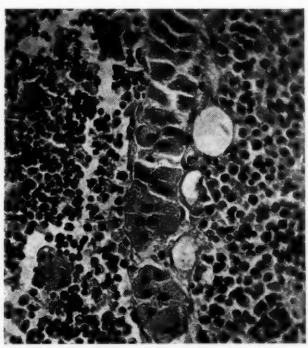
FIG. 5.—*Higher-power view of central part of tumour.*

A string of supra-renal cortical cells (S) traverses the section. Masses of small round cells in fat invest them.



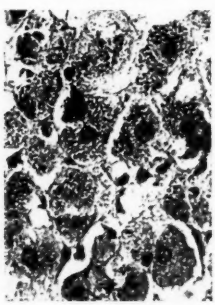
(*a*)

Shows the resemblance in structure and arrangement to the zona fasciculata.



(*b*)

A string of similar cells in centre of tumour.



(*c*) High-power view of cells showing vacuolation where lipoid has been dissolved out, and pigment granules in cytoplasm.

FIG. 6.—*Showing the structure of the cortical tissue*

continuous with, those forming the capsule. In the larger septa these cells were fifteen to twenty cells thick; in the smallest they were composed of similar cells strung out in single file. The cells were large, average diameter 12μ. in apposition, and spherical to polyhedral in shape. Their abundant, strongly acidophile cytoplasm was crowded with lipoid droplets staining, but indifferently, with Scharlach R, and dusted over with brownish-yellow pigment granules. Their nuclei were central, ovoid and relatively small, sharply but not deeply staining, and showing a simple, finely-dotted reticulum, sometimes with one or two rather small karyosomes.

The cells forming this suprarenal-like tissue were fairly true to type. They did not form any structure resembling gland tubules and had no tendency to do so. The connective tissue was scanty and the vessels primitive, being either sinusoids lined by tumour cells or capillaries with single cell walls.

The most remarkable constituent of the tumours was the small cell tissue, which under low powers, in parts where fat was absent, gave the impression of a round-celled sarcoma, but in other sections, where fat was present, closely resembled bone marrow. The latter resemblance was very striking in the majority of sections, for this sarcomatous-looking tissue had apparently spread into the fasciculi of suprarenal cells, and shaving off a cell here and there, had isolated it. Such cells, swollen and degenerate, often showing much nuclear distortion and irregularity, were seen lying surrounded by round cells with deeply-staining nuclei scattered in adipose tissue, the whole producing a very fair imitation of mega-karyocytes and the elements of bone marrow. That this resemblance was probably only superficial was suggested by finding in these isolated cells in frozen section the same lipoid droplets and pigment granules as were found in the cells composing the capsule and its interlobular septa.

The nature of this round-celled tissue is obscure. Some possibilities are :—

1. That it is bone marrow derived from the tissue of the corresponding body segment, misplaced during the development of the suprarenal cortex from the Wolffian ridge.
2. That it represents the medulla of the glands or is a new growth (neuroblastoma) of this tissue.
3. That it is sarcomatous and derived from the gland stroma.

Many attempts were made to stain specific granules in the cells

to support the first hypothesis and to demonstrate neuro-fibrils in support of the second, but without success. The giant cells in this tissue are probably not megakaryocytes because of their heavy load of lipoid. It is unlikely that these cells represent a neuro-blastomatous growth because of the absence of rosette formation, neuro-fibrils and metastases. The exact nature of this constituent is thus uncertain, but we are inclined to regard it as sarcomatous, chiefly because of the lack of arrangement, the evidence of vigorous growth and absence of differentiation of its cells. This conclusion is supported by the history, *i.e.* recent rapid enlargement of the tumour sufficient to produce acute obstruction and the presence in both tumours of recent hemorrhage.

Summary of Case Report.

A woman of 70, who had been catheterised several times during the last few months of her life for retention of urine, was admitted to hospital for intestinal obstruction.

A large tumour mass was found replacing each suprarenal gland. The tumours were due to bilateral cortical hyperplasia of the suprarenals with diffuse fatty infiltration: their stroma was probably sarcomatous.

Her secondary sex characters approximated to the male type, the voice, physique and hirsuties being masculine. Considerable hypertrophy of the clitoris was present. The uterus, ovaries and vagina were rudimentary.

The prostate was enlarged, its "middle lobe" sufficiently so to cause a degree of retention only relieved by catheterisation.

No tissue resembling the male testicle was found in the pelvis.

Summary of Pathological Examination of Suprarenal Tumours.

A greasy tumour mass replaced each suprarenal gland, that on the left side weighing several pounds.

Neither tumour was infiltrating the surrounding tissues. An intact capsule, very closely resembling the suprarenal cortex in histological structure and arrangement, enclosed each tumour, and branches from this, of similar structure, formed a wide-meshed, irregular network in its interior.

The meshes of the network were filled by hemorrhagic fat. Lying deep to the capsule was a cellular layer equal to it in thickness, and composed of small round cells infiltrating the underlying fat. Similar cells invested the branches of the capsule in the interior of the tumour.

Pathological Diagnosis.—Bilateral cortical hyperplasia of the suprarenal glands with sarcomatous change in their stroma.

Comments.

There is little doubt that in this case we are concerned entirely with an abnormality of internal secretion, and it may be taken as a general rule that the more closely the suprarenal hyperplasia or tumour formation copies the mother tissue the more developed will be the symptoms of virilism. In our case the resemblance was close, when allowance is made for distortion, hemorrhage and necrosis.

There are several points of interest in the interrelation between the hormones associated with sex characters, some of which our case clearly illustrates. Firstly, it is probable that the hormones of one sex do not neutralise those of the other: both may act together. Secondly, the somatic cells of the body have the potentialities of both sexes. Thirdly, the close relation which exists between the cortex of the suprarenal and the gonads is supported by their origin from a common anlage, and by the fact that in rabbits who

survive extirpation of both suprarenals for a sufficient time the interstitial cells of the ovary show hyperplasia ; and lastly, gonadectomy, pregnancy and ovulation are all accompanied by hyperplasia of the suprarenal cortex.

The literature, especially the contributions of Bulloch and Sequeira[1] and Glynn[2, 3] contain many references to virilism of suprarenal origin, and there are two cases[4, 5] of virilism in females in which, following removal of a suprarenal tumour, the pronounced male characters disappeared, partially in one, completely in the other. In another[6] removal of an ovarian tumour, possibly a hyperplastic suprarenal rest, was followed by a similar result.

We are much indebted to Miss C. I. Cooke, B.Sc., of the Pathological Department of the General Hospital for valuable technical assistance.

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THE OCULAR SIGNS OF MIGRAINE.[1]

BY

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VISUAL phenomena form one of the most constant and striking features in migraine attacks. Gowers points out that the prodromata of migraine are a functional disturbance in the sensory organ, and so is the headache which succeeds. By the headache is implied a coarse disturbance consisting of pain, often intense, or, on the other hand, slight and of short duration, whilst in some cases the prodromata occur alone, not being followed by headache. These premonitory symptoms, although sensory, do not include pain. The sense of sight is very often involved, sometimes by loss, partial or general, sometimes by an elaborate display of its higher crude functions, in light, colour or apparent motion.

Of the processes which induce the premonitions we have only hypothesis to rest on; there is clearly a disturbance of function in certain parts of the cerebral hemisphere, probably the cortex, which is the subsequent seat of the pain. The disturbance in function is apparently crude, and seems as it were to ripple through the centre, leaving an inhibited condition, which quickly passes away. It is possible that cerebral anæmia due to vaso-motor spasm is the cause of

[1] A Paper read at a Meeting of the Bristol Medico-Chirurgical Society, held at the University of Bristol on January 13th, 1926.

these prodromal symptoms, and in support of this is the fact that the retinal arteries are markedly contracted during the prodromal stage.

Many of the ocular manifestations of migraine closely resemble the visual aura present in epilepsy, and in rare cases the conditions co-exist. The prodromata of migraine are, however, never followed by any motor symptoms, except for some muscular twitchings in those cases in which the headache is very severe.

An examination of the eyes during the prodromal symptoms or the attack itself reveals little. The pupils are usually dilated but react well to light and accommodation. In some cases the pupils may be in a state of hippus, *i.e.* they may be seen with the naked eye to contract and dilate rhythmically quite apart from any change in the intensity of the light.

The only constant manifestation of migraine seen on an examination of the fundus is a definite contraction of the arteries; and this condition is particularly noticeable if one follows the retinal vessels towards the periphery. It is most marked during the prodromal stages, and is less during the actual attack. The retinal veins are unaffected, or, if anything, dilated. In the cases I have examined I have not seen one case in which the vessel walls showed anything of the nature of arterio-sclerosis, and, if we assume that the retinal vessels are any guide to the condition of other vessels from the same source which go to supply the brain, it would point to these arteries being healthy, but a similar contraction may be present in the cerebral vessels, as is so clearly seen in those which supply the retina.

By far the commonest premonitory symptom of migraine is the appearance in the vision of spots;

these vary in number, are usually small and have an irregular outline. Coloured spots are not uncommon, nor are those whose centre is black and the edges either coloured or glittering. Frequently, usually just before the headache commences, there appears amongst these spots a comparatively large and glistening ball, situated at or near the centre of vision. Such was the condition in a case I recently saw of a young man who for some hours before the headache commenced could, with difficulty, carry on his work as a clerk, owing to the fact that, as he put it, he could not see through the myriads of spots when looking at white paper, and that for another hour or so before the attack he was entirely prevented from reading or writing owing to the large glistening ball which occluded his central vision. I was able to map out the visual fields in this case, and found a small central scotoma for white and colours, whilst a much larger area of the field was also blind for red and green.

Sometimes in place of the spots in the vision the patient complains that objects appear as if they were seen through a haze, such as rises from the earth on a hot day. In these cases I have found no abnormality in the visual fields.

The so-called scintillating scotoma is another and very characteristic ocular manifestation of migraine; it may precede the attack by a day or only by a few hours. The duration of these attacks is usually short, not lasting more than an hour or so, only to be followed by a typical attack of migraine; but in exceptional cases the blindness produced by the scotoma may be of very much longer duration. Thus in a case I saw the other day a young woman had been shopping in town, when suddenly and without any warning flashes of light appeared before her eyes, rendering her in the

course of a few minutes quite blind. When I saw her both eyes were affected, and the vision amounted to not more than counting fingers at two feet. The fundus on examination was normal, except for a contraction of the retinal arteries. There was some vertigo but no true headache, the pupils were dilated but reacted well to light. She gave a typical history of migraine, and said that it had been in her family for generations. She had, in past attacks, had flashes of light and diminution of vision before the headache commenced, but she had never experienced anything like the present condition. I watched her for three hours; after the first hour the headache commenced and vision began to clear, and by taking a rough visual field I found that the scotoma was gradually clearing from the periphery to the centre. At the end of the third hour both vision and visual fields were normal, but by now she had an intense headache with vomiting.

The foregoing case at first suggested one of the fairly common functional varieties of blindness, but the past history and the subsequent vomiting is, I think, sufficient evidence that the condition was due to migraine.

Other cases are met with in which coloured zig-zags appear on one side of the visual field, with at first a reduction of vision on this side only. Slowly the spectrum passes to the opposite side of the field, until vision is completely lost. Or the coloured zig-zags may be intermittently scattered over the visual fields, and in these cases vision is lost and regained alternately for a while until either temporary blindness results or the prodromata cease and the headache commences.

The above types of scotomata are undoubtedly of central origin, as they always affect both eyes with normal fundi. It is probable that severe symptoms

of such short duration could only be caused by disturbances of the circulation, the transient character indicating some disorder of the innervation of the vessels, and not disease. The circulatory disturbance sets up an irritation of the optical elements in the occipital lobe, and this irritation, by the natural laws of projection, is referred to the external world and appears in the form of a scintillating scotoma.

Perhaps the most interesting of all the ocular manifestions of migraine is in those cases in which the prodromata are in the form of a transient hemianopia. These are usually of the homonymous or lateral type, so that the patient is unable to see objects to the right or the left. More rarely the upper or lower halves of the fields are involved, the so-called altitudinal hemianopsia. This type of partial blindness is usually rapid in onset, and except for some slight dizziness the patient is usually quite well; its duration is usually short, to be followed by the typical headache. Cases are, however, recorded in which the hemianopsia appeared with the headache and even persisted after it. The visual fields in these cases rarely show a complete hemianopsia, *i.e.* the dividing-line between the blind and seeing halves of the fields does not, as a rule, pass through the fixation point. Sometimes in the blind halves of the field there may be flashes of light or sensation of colours, or the edges of the scotoma may be zig-zagged and glittering.

Patients who have had migraine for years with visual prodromata, but who have never had the homonymous type of scotoma, may suddenly be attacked in this way, or the homonymous type may be the usual phenomenon with them.

Thus a middle-aged lady, who stated that she had suffered from sick-headaches since she was a girl,

suddenly experienced flashes of light in her eyes; this was followed by zig-zag lines with coloured edges. She happened to look at the face of a clock, and found that she could not see anything on her right side. She was well accustomed to the flashes of light as prodromata of previous attacks, but she had never seen the zig-zag lines with coloured edges, nor had she ever experienced failure of half her vision.

A visual field in this case showed a marked right homonymous hemianopsia, not involving the fixation point. Her subsequent history was a very severe attack of headache and vomiting, but when I saw her some days after the attack there was no sign of any contraction of the visual fields, the acuity of vision being normal.

Gowers and Ormond quote cases in which the hemianopsias of migraine have not been recovered from, and have persisted for years, if not permanently. Gordon Holmes also mentions a similar case in a woman, aged 30, married and healthy. Wassermann negative. No heart trouble nor Bright's disease. The pulse tension was good, but she had suffered from childhood with severe attacks of characteristic ophthalmic migraine, unilateral headache with typical subjective visual phenomena. After one of these severe attacks she was lying down in consequence of the headache, and when she got up she found that the blindness, which she said generally preceded the onset of the headache, persisted for a much longer time than usual. She was found to have complete left homonymous hemianopsia. He had watched the case for three or four years, but the condition still persisted. He had not been able to account for it. These cases seem to suggest that simple migraine may be followed by permanent lesions involving the cortical area. If migraine is due to vasomotor spasm causing anæmia in the region supplied by

those vessels, and the subsequent dilatation of the arteries causes the pain, it may be that the temporary spasm has been sufficient to cause a permanent thrombosis in the vessels in question. The retinal arteries can be seen, and are, as I have pointed out, always markedly contracted during the prodromal symptoms of migraine.

Finally, we come to a group of cases which are rarely met with, and are characterised, not by a scotoma, but by paralysis of a recurrent type affecting the muscles supplied by the third nerves. Charcot labelled these cases " Ophthalmoplegic Migraine," owing to the fact that muscle paralyses are always associated with symptoms resembling migraine. These paralyses are at first temporary, passing away as the attack of migraine subsides, but later they tend to become permanent.

In most cases migraine, without paralysis of the ocular muscles, has existed for years, then, during an attack of unusual severity, the ocular palsy appears and thereafter occurs in subsequent attacks. It remains limited to the side in which it first occurred, and is seldom, if ever, bilateral. The condition affects the sexes equally, and usually begins in early life. The paralysis outlasts the attack of migraine, and may take from one to seven days to recover. The extra-ocular muscles supplied by the third nerve are those usually involved, resulting in an external squint with some ptosis, whilst the intra-ocular muscles usually escape.

It is perhaps unfortunate that these cases should have been classified by Charcot as ocular symptoms of migraine, as his classification is followed to the present day; for although the headache and vomiting are so suggestive of migraine, careful inquiry fails to elicit any of the prodromal ocular symptoms, such as scotomata,

hemianopsia, or visual spectra. It is probable that these palsies are not due to migraine, but are organic in origin.

As regards the treatment of migraine, I am, fortunately, only concerned with that of the eyes. This resolves itself into correcting any errors of refraction and dealing with abnormalities in the muscle balance of the eyes.

As regards errors of refraction, I am quite convinced that migraine cannot be cured by the most carefully prescribed glasses, but there is also no doubt that the interval can be prolonged between the attacks.

The correction of large errors of refraction seems to do little to help the patient, probably because there is very little strain in these cases, as the patient finds it so difficult to see clearly that he gives up trying, but it is to the small errors of refraction, particularly astigmatism, that we must so carefully draw our attention if we are to do our best for the patient. It is not the slightest use testing these patients' vision with a test-card, finding it normal, and so assuming that there is no error of refraction. All cases of migraine should have their pupils dilated and a careful retinoscopy done. Small errors will thus be detected that by any other method would escape notice.

As regards the correction of any abnormality in muscle balance, this is probably more important than the correction of errors of refraction. The strain produced is greater, and the result from wearing even a very small prism is such that the possibility of an error of this nature should never be overlooked.

DISCUSSION.

Col. Lister said that in his experience of migraine the order of the symptoms was sometimes reversed;

that is, the typical ball of light was noted in the attacks of early youth, but disappeared in later life. He mentioned a case.

DR. CHARLES asked why Mr. Chambers considered the cerebral cortex was involved in migraine. For himself he regarded migraine as due to pituitary swelling. We knew that at times alterations in the thyroid or ovary caused changes in the pituitary. The anatomical relations appeared to favour his view. The vascular and nervous structures, including sympathetic supply in the immediate neighbourhood, would explain the local symptoms, glycosuria, polyuria, anarthria, diarrhœa seemed to point to the pituitary. He found that pituitary lesions generally produced not bitemporal hemianopsia but homonymous.

DR. CARLETON agreed with the last speaker that the cortex could not be the site of the lesion, especially if we were to include migraine of the Charcot type, with ophthalmoplegia. The latter cannot be cortical. He suggested that pure perception of light was of the nature of a protopathic sensation; vision as we knew it was epicritic. Spasm of the ophthalmic artery suppressed the latter and released the former to consciousness. However, he could not conceive that a pituitary swelling (apart from a gross enlargement) could affect the structures in, and in the outer wall of, the cavernous sinus. In his experience the hemianopsia of pituitary tumour was bitemporal.

MR. CHAMBERS replied. He could not accept Dr. Charles's suggestion that pituitary swelling explained the syndrome of migraine. Nor did he think that the Charcot type was a true migraine. He agreed that blindness might quite well be retinal, but this would not explain the cases in which a hemianopsia occurred.

Reviews of Books.

The Diagnosis and Treatment of Tuberculosis of the Hip. By G. R. Girdlestone, B.M. (Oxon.), F.R.C.S. Pp. x., 94. Oxford Medical Publications. 1925. Price 8s. 6d. — The author writes with freshness, originality and conviction which immediately claim attention. The book is entirely clinical in its scope and practical in its design. The importance of early diagnosis is insisted upon, and the view is expressed that all doubtful cases, even with negative X-ray findings, should be sent to a special institution for further investigation and treatment. This may be an unattainable council of perfection, but it is well to have it set up as a standard. The X-ray figures and the typical case reports are most instructive. The chief criticism which may be made is that the book is too small to deal even with the practical aspect of the question, and yet appears so much to be a specialist's monograph that it will not be read by the general practitioner.

Manipulative Surgery: Principles and Practice. By A. G. Timbrell Fisher, F.R.C.S. (Eng.). Pp. viii., 168, with 62 illustrations. London: H. K. Lewis & Co. Ltd. 1925. Price 7s. 6d.—The author considers it desirable to draw the attention of the medical profession to the possibilities of manipulative surgery. It is popularly supposed that unqualified " bone setters " have possession of knowledge and methods which are denied to the medical profession. Probably the better-class " bone-setter " would rather claim special dexterity and instinct than special knowledge. A short historical introduction serves to give the views of such leading men as Hunter, Hilton, Thomas, Wharton Hood and Paget, and a strong opinion is expressed in favour of special teaching of manipulative surgery in the medical curriculum. The cases said to be cured by bone-setters are : (1) adhesions in and round joints ; (2) functional conditions ; (3) unreduced dislocation or sub-luxations. In the matter of diagnosis of conditions likely to be benefited by manipulation stress is laid upon evidence of active disease, and especially tubercle. The body of the book consists of a description of the anatomy, movements and disabilities of the main joints, a consideration of the knee occupying the largest space. The illustrations are clear and

good, though it may be questioned whether many of those depicting normal limbs are necessary. Mr. Fisher, who has already done good work on internal derangement of the knee joint, is to be congratulated on having given an accurate and concise account of a subject which is too often shrouded in mystery.

The Early Diagnosis of the Acute Abdomen. By Zachary Cope, B.A., M.D., M.S. (Lond.), F.R.C.S. Pp. x., 233. Third Edition. Oxford Medical Publications. 1925. Price 10s. 6d.—The appearance of a third edition of this book is the best proof that it has filled a want. While it is no doubt true that the best place to learn the subtleties of abdominal and every other kind of diagnosis is the bedside, there are many occasions when the inquirer, especially if he be inexperienced, will turn with gratitude to such a mine of information as is contained in the book under notice. There is no finality about abdominal diagnosis, and mistakes are made by those even of the ripest experience. Most of these errors are the result of the failure to observe some point which is perfectly obvious to the seeing eye. In so far as books can teach so essentially clinical a subject as abdominal diagnosis, we can imagine no book more helpful than this. Think of any case where your diagnosis was wrong, and here you will surely find what would have put you on the right track if only you had had it in your mind. One or two examples must suffice. The confusion of cases of right-sided chest disease with appendicitis is well known, but mistakes are still made only too often. A more subtle error, the confusion of "abdominal" uræmia with surgical conditions, still constitutes a trap for the unwary. Both these points, and countless similar ones, receive adequate notice. We have no doubt but that the new edition will receive a welcome no less warm than its predecessors. The student, qualified or unqualified, who absorbs the contents of this book and applies his knowledge at the bedside will avoid many a pitfall which might otherwise have proved his undoing.

Coaching Manual for Midwifery Students. By Félicic Norton, S.R.N. Pp. viii., 110. London: The Scientific Press. 1925. Price 1s. 6d. net.—A small revision manual for midwives, especially useful for reading between the written and oral examinations of the Central Midwives Board.

A Synopsis of Gynæcology. By Arthur Gray, F.R.C.S., M.R.C.P. Pp. viii., 352. London: E. Arnold & Co. 1925.

Price 10s. 6d. net.—This, another of the "Synopsis" Series, is an extremely well-arranged text-book. It contains not only all the essentials of the various gynæcological conditions, but also excellent chapters on the endocrine organs in their relation to diseases of women, and on forensic gynæcology. The inclusion of this last chapter is extremely useful, and should be invaluable to the newly-qualified doctor. This text-book should be in the possession of every student, to be read especially for revision prior to his examination.

Public Health Laboratory Work (Chemistry). By Henry R. Kenwood, C.M.G., M.B., F.R.S. (Edin.). Pp. xi., 369. Eighth Edition. London: H. K. Lewis & Co. Ltd. 1925. Price 12s. 6d. net.—We welcome a further edition of this well-established text-book of Public Health Laboratory Work, which is mainly confined to the chemical side, but is also interspersed with a certain amount of bacteriology. This edition adheres to the main lines of its predecessors, and, with those few additions which bring the book up to date, constitutes the best text-book on Public Health Chemistry for the examination for the Diploma in Public Health, while it is also an exceedingly valuable book for reference purposes. In Part 1 a chapter dealing with the opinion on water samples gives an excellent series of varying types of potable water, good, bad and indifferent, which will be of great value to the student. Part 2 appears as merely an addendum to this part, and might almost have been included in it as a separate chapter: it would then have been unnecessary to repeat a description of Winkler's process. Part 3 deals with air and the forms of pollution to which air is liable. Part 4 (food examination) is that section of the book which has most tendency to grow, and those engaged in the teaching of Public Health Chemistry know how difficult it is to confine this portion of the subject within reasonable limits. A remark on page 207 is so apt that we will quote it: "Whether milk is naturally poor or has been made so by the addition of water, the dairyman who sells it defrauds the purchaser, for the latter demands and pays for pure milk of average quality." This point was well illustrated in Bristol recently, when a cow was discovered in a herd which yielded milk equivalent to milk of average quality after 7 per cent. of water had been added. We think the volatile acids in butter should have been dealt with by the Reichert-Polenske process, with merely a reference to the Reichert-Meissel method, as the latter is now rarely carried out. We are glad to see the inclusion of the new standard for condensed milk, though the analysis of this substance involves work

which is far beyond the scope of the average Public Health course. This part contains a description of the analysis of Rag Flock, and the book concludes with a short part on disinfectants. It is probably correct to say that the majority of doctors at present engaged in the Public Health service were brought up on Kenwood's *Public Health Laboratory Work*, and we look forward to the day when a resuscitated Public Health Course in the University may bring this excellent book into use.

The Extra Pharmacopœia of Martindale and Westcott. Revised by W. H. Martindale, Ph.D., Ph.Ch., F.C.S., and W. Wynn Westcott, M.B. (Lond.), D.P.H. Eighteenth Edition. Volume II. Pp. xiii., 728. London: H. K. Lewis & Co. Ltd. 1925. Price 20s. net.—This volume deals chiefly, as in previous issues, with analytical, experimental and research work, Volume I. being concerned largely with matters relating to treatment. It would be quite impossible in a short review to deal with all the subjects referred to and the analytical methods described, but the fact that the book is well up to date is illustrated quite well by the inclusion of an account of the work on Isotopes and Atomic Numbers carried out by Aston and others. Those practitioners of medicine who are interested in pharmacological problems will read with interest details relating to the determination of activity of certain well-known drugs, notably aspirin and its derivatives and digitalis preparations. There is an interesting section on the organic arsenic compounds, in which manufacturing and analytical methods are dealt with and which includes a short historical account of Salvarsan by Ehrlich. The analytical memoranda contain descriptions of methods used in blood and urine analysis and in the investigation of stomach contents. Some instructive references are made to proprietary medicines, and the alleged composition of many of these is given. Under "Bacteriological Notes" are included a vast number of different subjects, among these being summaries of work on researches relating to the causation of malignant tumours; food poisoning is also dealt with in this section, including Botulism and canned food poisoning. A considerable amount of space is naturally given under this heading to the staining and differential recognition of bacteria, and a number of useful formulæ are given. The penultimate section includes glossaries of Arabic, Belgian, Danish, Dutch, French, German, Italian, Portuguese and Spanish terms, and the volume ends with an alphabetical index and posological table. A most valuable feature of this volume is that many

references are given to original papers, which is a great advantage to workers in special branches of research. We congratulate authors and publishers alike on the excellence of their work, and consider that it should be in the library of all those medical men who are interested in the scientific progress of their profession.

Post-Mortem Appearances. By Joan M. Ross, M.B., B.S. (Lond.), M.R.C.S., L.R.C.P. Pp. 216. Oxford University Press. 1925. Price 7s. 6d. net.—This little book of 216 pages in convenient pocket size contains in a condensed but very lucid form a description of the post-mortem appearances in the commoner diseases. Following some general remarks, which include directions for carrying out a post-mortem examination and methods of preserving specimens, the author describes the post-mortem findings in death from physical and chemical agents, and from general and systemic diseases. Information as regards normal weights and measurements, date of ossification centres, etc., are given in an appendix. The book will be very useful to the student, since it contains much that is not mentioned in the ordinary text-books, whilst the practitioner will find it a ready reference book for the successful carrying out of an occasional post-mortem examination.

The Post-Graduate Medical Journal. The Official Organ of the Fellowship of Medicine. 1 Bedford Street, London, W.C. 2. Volume I. No. 1. October, 1925. Price 6d. Annual Subscription 6s.—*The Post-Graduate Journal* is the official organ of the Fellowship of Medicine. It concerns itself chiefly with the arrangements for post-graduate work in London, but in time, no doubt, it will be extended so as to include all the provincial post-graduate facilities. In addition, the Editor proposes to publish a selection of the lectures which are delivered at the instance of the Fellowship of Medicine. "It will be our endeavour," he says, "to select only such subjects as will from their essentially practical character make the strongest appeal to the general practitioner for whom the resources of post-graduate teaching are particularly indicated." The first number contains an excellent contribution by Sir Humphry Rolleston on the "Medical Aspects of Gallstones," and a concise consideration of "The Prevention of Puerperal Sepsis," by Dr. T. W. Eden. Both of these are of a practical nature, and none of our readers should miss consulting them. We extend a hearty welcome to the new venture, and wish

it success. The medical literature of to-day is an increasing burden for the graduate, but if post-graduate work is to be systematised, made attractive and available, a periodical such as this should be of considerable use in directing the intending worker where and how he may best spend his scanty time for keeping abreast with current developments.

An Index of Treatment. By Various Writers. Edited by Robert Hutchison, M.D., F.R.C.P., and James Sherren, C.B., F.R.C.S. Ninth Edition, revised and enlarged. Pp. xviii., 1,035. Bristol: John Wright & Sons Ltd. 1925. Price 42s.—Four years have elapsed since the last edition of this valuable reference work appeared; during that time many important advances have been made in the science and practice of medicine in all its branches. The ninth edition now under review embodies all of these advances. For example, the discovery of Insulin has revolutionised the treatment of diabetes entirely. The directions for its use will be found clearly set out. Our knowledge of asthma, especially of the forms due to protein sensitisation, has been considerably enlarged: this forms the subject of a re-written and instructive article. The progress made in the treatment of fractures is described very fully. There are many additions to and alterations in the articles dealing with gonorrhœa, nephritis, syphilis and tropical diseases. The surgery of the prostate, kidney and gall-bladder has developed also in the past few years, and these developments are duly noted. It is unnecessary to recommend such a well-known work to our readers; it is sufficient to say that it has been brought up to date in the ninth edition.

The Stomach and Upper Alimentary Canal in Health and Disease. By T. Izod Bennett, M.D. (Lond.), M.R.C.P. Pp. xv., 344. London: William Heinemann (Medical Books) Ltd. 1925. Price 21s. net.—Dr. Izod Bennett has written a book of great importance as well as interest to the general practitioner. He is especially deserving of thanks for the inclusion of a chapter on diseases of the teeth and gums, which helps to a clearer understanding of the overworked phrase "oral sepsis." As the author says, "it is only by the medical practitioner's familiarising himself with the rudiments of dental pathology, and keeping in close touch with his patients' dental surgeons, that the necessary co-operation will be secured which will eventually lead to a great improvement in the health of the community." Dr. Bennett displays well-balanced judgment in his remarks on the part played by oral infection in the

production of general diseases. The physiology of the stomach is most readably described, and the blending of clinical application with physiological observation is admirable. The examination of patients is given in very detailed fashion, without being at all long-winded. The explanations of gastric analyses and of radiographic appearances are most understandable; and Dr. Bennett is extraordinarily level-headed in appraising the value of the various aids to diagnosis. His account of peptic ulcers, their symptoms, diagnosis, treatment and complications is as good as any we have read. He is a staunch advocate of Sippy's method of dieting, "its main principles," he says, "should be rigidly adhered to," although "it was designed for the American patient, and items must be changed to adapt it for the British palate." The advice given as to the choice of cases for operative treatment is thoroughly sound. Another chapter worthy of careful attention is that on "Disorders of gastric function." This book is a notable contribution to medical literature, it brings recent advances in physiology and pathology into close touch with the everyday problems which confront the practitioner. The diagrams and illustrations are well chosen and clearly reproduced. We have praised the book highly, but not more than it deserves.

Selected Papers, Surgical and Pathological. By F. T. Paul, Ch.M. (Liverpool), F.R.C.S. Eng. Pp. vii., 284. London: Baillière, Tindall & Cox. 1925. Price 15s.—This volume, containing reprints of Mr. Paul's more important contributions to surgical and pathological literature, is the outcome of the desire of the surgeons of Liverpool to express their admiration and appreciation of the quality of Mr. Paul's work, and as a token of their respect and affection on the occasion of his seventy-fifth birthday. "Paul's Tubes" for colotomy and colectomy are familiar to all surgeons, and frequently used. They are a constant reminder of the fact that when the technique of colectomy was in a very imperfect stage of evolution Mr. Paul introduced a method of operating which was much safer and more successful than any other then in use. And it is interesting to read in this book the original paper, published in 1892, which contains the earliest description by the author of his method. We have not space to comment on the various addresses and papers gathered together here, but must content ourselves by saying that each well repays attentive study. They are full of penetrating observation and practical wisdom.

A Textbook of Pathology, General and Special. By J. Martin Beattie, M.A. (N.Z.), M.D. (Edin.), M.R.C.S., L.R.C.P. (Lond.), and W. E. Carnegie Dickson, M.D., B.Sc., F.R.C.P. (Edin.). With 499 illustrations in the text and 17 coloured plates from original preparations. Third Edition. Royal 8vo. Pp. 1,130. London: Wm. Heinemann (Medical Books) Ltd. Complete Volume, price 42s. net. Or in Two Volumes: Part I., General Pathology; Part II., Special Pathology, 25s. net each.—In our recent review of the third edition of this well-known text-book (vol. xlii., p. 239) we commented unfavourably on the great weight of its one volume form. Our attention has since been drawn to the fact that the work may be obtained either in one volume or in a two volume form as indicated above. Obviously our objection to the weight of the one form does not apply to the other.

History of Medicine. By Dr. Max Neuburger. Translated by Ernest Playfair, M.B., M.R.C.P. Volume II. Part I. Pp. vii., 135. Oxford Medical Publications. 1925. Price 7s. 6d.—The publishers' note to this first part of the second volume expresses regret that it is not yet possible to complete the English edition of Neuburger's *History of Medicine*. The present instalment is issued without waiting for the remaining parts, which will follow as and when the German original is published. A work such as Neuburger's is one which demands time as well as unremitting industry. The patience which Neuburger has shown in first-hand study of his sources will explain to every reader of his *History* why the publication is slow. Neuburger has accepted little or nothing on the authority of others. He views each period through his own eyes and draws his conclusions from the extant writings of the period in question. This section deals with medicine from the early Middle Ages, about the sixth century up to the later Middle Ages, closing just before the revival of learning in the fifteenth century. Neuburger traces with vivid realism the causes which led to the gradual transference of scientific study to ecclesiastical circles, showing how Italy, once the centre of civilisation and learning, was overspread by "havoc and devastation, famine and misery, savagery and brutality" during the sixth century. Finally, science "deprived of almost every other aid . . . was forced to betake itself to the shelter of the Church and to seek refuge in monastic seclusion." The price of the Church's protection to science in that age was the linking of superstition, thaumaturgy and theurgy with

the traditions of rational practice in medicine. In Italy there survived, however, some remnant of antique heathen culture independent of and even in opposition to the Church, awaiting better and quieter days. Neuburger points out that beyond the Alps clergy and monks, in medicine as in culture in general, occupied a far more dominant position than in Italy. The part played by the Celtic monasteries is admirably described: "It appears a wonderful dispensation of Providence that, during the terrible devastations of the sixth to eighth centuries, in a truly forlorn age of general decay of civilisation the heirlooms from antiquity should have been hidden in Ireland, the *Ultima Thule* of Christianity." Alcuin's influence on Charlemagne meets with full recognition, for it was mainly through his influence that the scientific traditions of the schools of York, Winchester and Canterbury were disseminated upon the Continent. Thus, from the ninth century onwards, medicine was included in the educational system of the Frankish monastic schools. In the eleventh and twelfth centuries the famous school of Salerno was in its prime, a health resort for invalids and a rallying-point for physicians who perhaps had not altogether lost the threads of late-Roman tradition. Here a school grew somehow and flourished without an ecclesiastical foundation, owing something, no doubt, to the Graeco-Roman tradition, but more perhaps to the Arabians with their Jewish and Nestorian physicians. It was at Salerno that the art of surgery was re-established on a scientific basis. In the Christian West the rule held good: "Ecclesia abhorret a sanguine," and surgery was relinquished to uneducated empirics. To Salerno may be traced the rise of schools of medicine at Montpellier, Bologna and Paris. Thus at last the spark of learning which the Arabians had preserved was rekindled in the West. The remainder of this volume traces clearly and fully the gradual rise of importance of the Arabian tradition until the dawn of the Renaissance is reached. Neuburger's grasp of the spirit of the age is unrivalled, he tells his story with rare artistry, and, in this English version, he owes not a little to his admirable translator.

Editorial Notes.

The Journal's New Series.

With this issue the Society's Journal appears in larger pages and type, which it is believed will enhance its value to our readers, in that the matter is presented in a better form, perhaps more worthy of the intimate association of the Medico-Chirurgical Society with the University of Bristol. The gift of the Society's valuable Medical Library to the University, now so splendidly housed, and the allocation of a room for the use of the members of the Society, the accommodation provided for its meetings and many advantages accorded to the Society conferred by the agreement between the University and the Society, but serve to mark their intimate association which we believe will eventuate in still closer ties, promoting the interests of the Medical Faculty and all that it connotes not only within the University but covering its field of influence, which is far and wide.

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With the completion of this issue the Editor resigns his charge, with gratitude to the Committee of the Society for appointing him to this office for so many years past, to the members of the Society for their support, and above all to his colleagues on the Editorial Committee. The co-operation of the Assistant Editor, Professor Nixon, throughout these years of the Editor's work, has been a continual encouragement, interrupted only by his foreign service during the war.

While esteeming it a great privilege to have been enabled to initiate this new series, he is confident that under a new Editor the value and sphere of the Journal's work will go forward and become still more widely recognised.

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Oxford D.C.L. conferred on Sir George Wills.

AN interesting ceremony took place at the house of Sir George Wills, Bart., on January 13th, 1926, when the honorary degree of Doctor of Civil Law was conferred on Sir George by the University of Oxford. Oxford and its Colleges have shown, by financial and other support, the greatest interest in Bristol since the foundation of University College. This last token of interest is much appreciated as a distinction conferred on the University of Bristol in the person of its Pro-Chancellor, as well as a richly-deserved tribute to a generous encourager of learning. Sir George was presented to the Vice-Chancellor of Oxford University by Sir Herbert Warren, a friend of boyhood days, who made an appropriate speech in Latin, containing the striking phrase: "Stat hodie domus vel potius palatium Academicum non Athenis non Alexandriâ indignum."

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The Lord Mayor's Hospital Sunday Fund and Addresses by Doctors.

THE following members of the medical profession in Bristol appeared in the pulpits of the churches named to plead the cause of the hospitals on Hospital Sunday, January 31st: Dr. D. A. Alexander, St. James's; Dr. Carey Coombs, Horfield Baptist; Dr. Hubert Bristowe, Brislington Parish Church; Dr. W. A.

Gornall, Eastville United Methodist; Mr. Wilfred Adams, Society of Friends, Redland; Dr. Noel Longley, St. Michael's (City); Dr. R. C. Leonard, Highbury Chapel; Dr. Francis P. Gill, St. Saviour's, Redland; Dr. W. A. L. Holland, St. Anne's, Brislington; Dr. T. B. Dixon, Tyndale Baptist; Dr. E. T. Glenny, Redland Park; Dr. F. J. A. Mayes, Trinity Wesleyan; Dr. Kenneth Wills, Castle Green Congregational; Dr. L. N. Morris, St. Lawrence; Dr. R. S. Carey, Brislington Parish Church.

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The Annual Service for the Medical Profession.

The Annual Service for the Medical Profession, held on October 18th, 1925, at Bristol Cathedral, was attended by a large and representative gathering of the medical and nursing professions. The preacher was the Right Rev. Dr. E. W. Barnes, Bishop of Birmingham. His text was taken from Ecclesiasticus xxxviii. 1: "Honour a physician with the honour due unto him for the uses which ye may have of him; for the Lord hath created him, and of the Most High cometh healing."

He said that a family physician was often forced by the circumstances of his profession to be a moral guide. In a modern community he, far more than any priest, received confidences and confessions, and if he did not formally grant absolutions, he gave advice by which his patient might win that self-control, that newness of life, which brought peace to the soul. Moreover, a doctor, if he was to maintain the great and honourable traditions of his calling, must preserve a lofty, ethical standard.

They all knew the famous Hippocratic oath, that fine ethical monument of pagan antiquity. The language of that oath, with its sincerity and directness, preserved a fine ideal.

He was happy to think that in this generation men of science were showing a new friendliness towards an enhanced appreciation of the Christian religion. He believed that, in particular, the various branches of the medical profession—and he might surely include nurses under that category — increasingly recognised the value of the spirit of Christ in human affairs, and saw the social dangers associated with the paganism which was, for them, the practical alternative. On the other hand, Christian clergy and ministers were, for the most part, showing a more generous, more open-minded regard for scientific truth of all kinds. Clergy and doctors alike powerfully influenced public opinion, and it would be to the advantage of the whole community if they could learn from and respect one another.

At the present time close co-operation was needed in connection with many social problems which resulted from the changed social conditions of the last hundred years. There was the great problem of the increase of inferior racial stocks, the multiplication of the feeble-minded. Christian sentiment and medical science had together put an end to the ruthless "weeding-out" processes of nature. Could they be content with the result? A solution could only be reached by combining Christian idealism with medical knowledge. But a related, though more difficult question, confronted humanity. He found himself forced to agree with those observers amongst them who traced the ultimate cause of the late war to the extraordinarily rapid increase of European populations during the last century. The great industrial nations instinctively realised that for their safety they must command supplies of food and raw material. The old checks upon over population were pestilence, famine and war. Medical science and social hygiene had eliminated pestilence, international trade had, under normal circumstances, effectively put an end to famine. War remained, and, as the late conflict went far to show, war would destroy their civilisation unless they could make it unnecessary.

So the question confronted them, and would increasingly perplex future generations, how could humanity avoid the danger to civilisation which resulted from excessive population increase? As he saw the future course of human history, that question would become of paramount importance. They must not import into its discussion heated prejudice. Statesmen must make their contributions; from physicians they needed accurate research, physical and psychical. The problem was alike international and personal. He contented himself

with pleading that the leaders of Christian opinion and the leaders of medical science must work in cordial co-operation if the great eugenic problems which confronted the whole world, and these overcrowded islands especially, were to be solved.

Dr. Barnes referred to the increase in the number of persons in the community who were mentally defective. There seemed to be no doubt that a tendency to both lunacy and feeble-mindedness was inherited. Christian teachers ought to combine with medical men to protest against the marriage of persons in whom such taints were latent. Knowingly to bring mentally deficient children into the world was a social crime, and the Church ought not to bless a union which in all probability would have that result. Other countries were beginning to take stringent measures to limit the increase of mental defectives. We ought to prepare public opinion to accept similar legislation in our own country. The question was becoming increasingly urgent.—From *Western Daily Press.*

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The Long Fox Lecture.

THE clinical and pathological research related in Dr. Carey Coombs's Long Fox Lecture represents scientific work of great interest and value, a contribution worthy of this foundation in memory of a distinguished Bristol physician, while it is a subject of legitimate pride that this original research emanates from our School. Not long since Dr. Carey Coombs and Dr. C. E. K. Herapath published (in our issue of October, 1924) the article on "Auricular Failure," when *inter alia* Dr. Herapath's work on the sino-auricular node and its import was recorded and illustrated. We may recall also the very early work of Professor Stanley Kent, who till recently held the Chair of Physiology at the Bristol University, for he it was who early in 1892, in his Rolleston Memorial Essay, and again in November,

1892, described the physiological import of the auriculo-ventricular bundle. Although generally spoken of as the auriculo-ventricular bundle of His, it is noteworthy that W. His first published his observations in 1893, the year following Kent's Memorial Prize Essay on the auriculo-ventricular bundle. Earlier still Gaskell (*Journ. of Phys.*, iv., 1883, p. 43) had shown that in lower vertebrates the auricular impulse spread to the ventricles through the muscular bundle connecting them. The clinical import of these observations was not generally recognised till many years later, but in no department of medical science has the last quarter of a century enriched knowledge more than in cardiology.

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Messrs. J. Wright & Sons' Centenary.

We offer our cordial congratulations to Messrs. John Wright, who have just celebrated their centenary, and wish them the continued success that they have attained so deservedly. From our medical standpoint the evolution of the *Medical Annual* and the authoritative position accorded to this work and to the *British Journal of Surgery* throughout the Empire and the United States of America are outstanding successes of which any publishing house might be proud, while their numerous other publications reflect their energy and artistic effort. This firm has served the medical profession in our city well, and they deserve our thanks. Quite recently they have strengthened their ties with us by a member of our Society being one of the Directorate.

Bristol is well represented in this respect, for our own publishers before many more years pass will have also completed their century of work by successive members of one family to whom our University and the Faculty of Medicine owes much.

Meetings of Societies.

Bristol Medico-Chirurgical Society.

The Annual Meeting of the Society was held in the University on Wednesday, October 14th, 1925.

After a vote of thanks to the retiring President, Dr. J. O. Symes, had been enthusiastically carried, Mr. T. Carwardine took the chair, and gave an introductory address on **"Continuity and Change in Life."** Later a cordial vote of thanks was given to Mr. Carwardine for the able and interesting address he had delivered.

The Hon. Secretary, Mr. S. V. Stock, and the Editorial Secretary read their annual reports.

The following are the officers of the Society for the Session 1925–26: *President*—Mr. T. Carwardine; *President-Elect*—Mr. A. L. Flemming. *Committee* (*ex-officio*)—Dr. J. O. Symes; Dr. Patrick Watson-Williams (*Editor*); Dr. C. King Rudge (*Hon. Medical Librarian*); Mr. A. L. Flemming (*Editorial Secretary*); Mr. S. V. Stock (*Hon. Sec.*). *Elected*—Mr. Lace, Dr. Nixon, Mr. Rayner, Mr. C. F. Walters, Mr. Hey Groves, Mr. Wright, Dr. H. L. Ormerod, Dr. Vincent Wood.

Dr. Parker and Dr. W. A. Smith represent the Society on the University Library Sub-Committee.

INCOME AND EXPENDITURE ACCOUNT OF THE BRISTOL MEDICO-CHIRURGICAL SOCIETY, 1924-1925.

RECEIPTS.	£	s.	d.	PAYMENTS.	£	s.	d.
Balance brought forward from last Account—				To *Bristol Medico-Chirurgical Journal*	175	0	0
Cash at Bank—				Librarian Honorarium ..	15	0	0
Current Account ..	68	6	2	University Marshal ..	1	0	0
Deposit Account ..	117	2	2	Miscellaneous Expenses—			
Cash in hands of Hon. Sec.	1	9	9	Postages and Sundries ..£7 8 0			
Members' Subscriptions ..	106	9	6	Printing and Stationery 4 0 6			
Interest on Bank Deposit..	2	11	2	Lantern at Meetings .. 3 3 0			
				Subscription Lewis Library 5 1 0			
				Repairs, Furniture 14 3 6			
				Do., Pictures .. 2 8 0			
					36	4	0
				Forward to next Account—			
				Cash at Bank—			
				Current A/c 46 2 2			
				Deposit A/c 19 13 4			
				Cash in hands of Hon. Sec. 2 19 3			
					68	14	9
	£295	18	9		£295	18	9

Wednesday, November 11th, 1925.

MR. T. CARWARDINE, President, in the Chair.

Dr. CARLETON read a paper on **"Some Problems of Pulmonary Disease with Special Reference to Radiography,"** reported with the ensuing discussion in our last number.

December 9th, 1925.

At this meeting the Society were the hosts of the Long Fox Lecturer, Dr. Carey Coombs. The lecture is reported on page 1 of this issue.

January 13th, 1926.

MR. T. CARWARDINE, President, in the Chair.

DR. ELWIN HARRIS exhibited a specimen of a **Calcified Fibroid.** On removal, this was cylindrical in shape, rounded at each end, two and a half inches in length, and about the same in circumference. It was encased in plates of calcareous material, on which were excrescences, some of which were as sharp as needles. The interior had also undergone calcareous degeneration. It was removed from a married lady of 38. She had one child only, who is now eleven years old. Since 20 years of age she suffered from indefinite pains in the pelvis and lower part of the abdomen. When 22 she was operated upon for an acute attack of appendicitis, and although she made a good recovery, the pains continued. Four years later she became pregnant. This ran its ordinary course, and there was no difficulty at parturition, but afterwards the pains were worse than ever. There was no menorrhagia. Dr. Harris examined her for the first time in October last, and found a hard swelling occupying Douglas' pouch, which was attached to the posterior surface of the uterus. On examining per rectum, a number of excrescences on the surface of the tumour were felt, so exceptionally sharp that, with moderate pressure, one could have easily injured the rectum. To leave a tumour of this nature in the peritoneal cavity would have been dangerous, and on November 26th Dr. Harris removed the tumour, which was found in Douglas' pouch, not in any way forming part of the uterus, but simply connected with it by a broad, flat adhesion; there were also adhesions to the brim of the pelvis, the omentum, and the small intestine. Removal was easy. The patient made an excellent recovery, and has had no return of the pains. Calcification of fibroids is generally found in old people. In this case the patient was comparatively young, and this occurrence may be explained as follows: this tumour started life as a subperitoneal fibroid with a pedicle. During the attack of appendicitis some adhesion probably formed which more or less anchored it in the pelvis. Pregnancy then commenced, and as the uterus rose higher and higher the pedicle was more and more stretched until eventually it snapped. The fibroid, deprived of its main source of blood supply, degenerated, calcified, and the sharp excrescences, in course of time, gave rise to the adhesions found at the operation.

MR. E. WATSON-WILLIAMS showed two cases of **Carcinoma of the Vocal Cord in Men.**

CASE 1.—Following laryngofissure in February, 1923, the first patient had remained perfectly well (three years). He is out daily, working as a newsvendor, and does about ten miles in his round. There is no sign of recurrence; several bands of scar tissue in part replace the vocal cord. As the arytenoid had to be removed, these bands are immobile; the voice is hoarse, but fairly strong.

CASE 2.—A man of 52 had been under treatment for six months for genital tuberculosis. Although hoarse for a time before, and very hoarse since July, 1925, his laryngitis had been supposed to be tuberculous. However, on examination in October a typically cancerous growth of the nodular type was seen, and its nature confirmed by biopsy. Operation was refused. This case afforded an interesting example of the importance of *always* examining the larynx in a patient with persistent (and especially painless) hoarseness.

DR. S. HARDY KINGSTON showed the following cases:—

CASE 1.—**Palmar Syphilide.** P.T., married, aged 40. Note the triangle of one palm only affected, presenting sheets of thickened exfoliating skin over a raw, inflamed area. This, associated with the dull red or purple nodules on opposite forearm, as well as the rupial condition of one knee, completes a clinical picture confirmed by ++ Wassermann and history of miscarriages. To be diagnosed from (1) Tinea of the palm. Scales usually smaller and exhibit fungus under the microscope. (2) Psoriasis. Eruption would be generalised and affecting the extensor aspect generally. (3) Seborr. Eczema. Condition bilateral and involving whole hand.

CASE 2.—**Lupus Vulgaris associated with Rodent Tumour.** Patient, a male, aged 60. Has had lupus of face for forty years. The pale scarring is very evident as the result of extensive ulceration. A raised pearly-looking tumour, half an inch in diameter, situated on the upper and posterior edge of the scar, proved by section to be a rodent tumour. This combination is unique.

CASE 3.—**Exfoliative Dermatitis (Arsenical),** following the exhibition of four doses of N.A.B. Note the generalised scaling from head to foot surmounting a profound erythema, and associated with intense pruritus. The soles and palms

show hyperkeratosis; the finger-nails are undergoing a process of fissuring and destruction. A most obstinate feature has been the hyperidrosis. Sodium thiosulphate was a failure in this case. This is not generally so. He is improving under intramuscular injection of contramine—a sulphur derivative.

CASE 4.—**Acne Rosacea.** Female, aged 30. This case illustrates the oily condition of the skin with inflamed pilosebaceous follicles leading to the formation of acne-like lesions. This patient, who was first seen yesterday, is shown to contrast with Mrs. X., aged 40, who has responded to treatment on the following lines: (1) Shampoo scalp once every ten days and apply each morning an antiseptic spirit lotion of sulphur or resorcin or mercury and salicylic acid. (2) Steam the face every night for ten or fifteen minutes, followed by the application of a lotion such as sulphur and chalk.

CASE 5.—**Lupus Erythematosus.** Female, aged 26. Showing typical "bat's-wing area" of face occupied by pink patches with raised infiltrated borders replaced in some areas by thin white scars, indicating retrogressive changes of an atrophic character. The ears show definite depressed cicatrizes, the result of superficial ulceration.

CASE 6.—**Lupus Erythematosus.** Female, aged 50. Duration of disease five years. Shown to illustrate the involvement of the scalp with its scaling pink atrophic area as large as a saucer. Note.—Lupus vulgaris never attacks the scalp.

The fifth case is responding to treatment.

The sixth has progressed in spite of treatment.

MR. E. R. CHAMBERS read a paper on "**The Ocular Signs of Migraine,**" reported with the ensuing discussion on page 29.

British Medical Association.

(BATH AND BRISTOL BRANCH.)

At the Clinical Meeting of the Branch held in the Medical Library of the University of Bristol on Wednesday, January 27th, the flag which the Bristol Division is presenting to the British Medical Association to be hung in the Great Hall of the New Building was on view.

The following cases and specimens were on the programme :—

Mr. A. W. Adams : Traumatic tetany ; tumour of the right intercarotid body.

Dr. Charles : Spinal lesion showing Brown-Séquard syndrome ; manganese poisoning.

Mr. H. Chitty : Osteogenesis imperfecta.

Dr. R. C. Clarke : Congenital syphilis ; congenital heart.

Mr. J. P. I. Harty : Postcricoid carcinoma, operation ; nasopharyngeal fibroma, operation and recurrence ; carcinoma of the pharynx ; tertiary specific laryngitis.

Dr. Herapath : Congenital heart.

Mr. A. E. Iles : Juvenile tabes with optic atrophy.

Dr. S. Hardy Kingston : Leprosy and photographs of a second case ; lupus erythematosus, two cases ; lupus vulgaris, three cases ; acne rosacea, three cases ; exfoliative dermatitis ; arsenical dermatitis ; trade dermatitis ; multiple tumours of body (? diagnosis).

Dr. Mundy : Dislocation of 1st cervical vertebra.

Dr. Phillips : Myoclonic contractions of diaphragm after lethargic encephalitis.

Mr. A. R. Short : Osteitis fibrosa of the clavicle treated by rib graft.

Dr. J. O. Symes : Hæmochromatosis.

Dr. Todd : Chronic anterior poliomyelitis ; spina bifida occulta ; subacute lymphatic granulomatosis.

DR. KENNETH WILLS : Lupus vulgaris treated with Pyrotropine ; toxic dermatitis treated with Light ; ulcer of nasal bridge resembling rodent ulcer.

MR. DUNCAN WOOD : Abscess of radius ; splenomegaly.

MR. ADAMS and MR. CHAMBERS : Tumour of lacrimal gland, Kronlein approach.

DR. NIXON and MR. CHITTY : X-rays showing cholecystitis in diabetes from injections of tetra-iodo-phenolphthalein sodium.

DR. NIXON and MR. WALTERS : A case showing the result of Steinach's operation.

MR. WALTERS and DR. HERAPATH : Acholuric jaundice and notes of a second case.

MR. CHITTY and DR. HERAPATH : Renal dwarfism showing rickets.

DR. BRISTOWE : Two Neolithic skulls.

DR. CLARKE : Skull with Parrot's nodes.

DR. FRASER and DR. HADFIELD showed some pathological specimens.

Obituary.

ARTHUR WILLIAM PRICHARD, V.D., M.R.C.S.

WITH the death of A. W. Prichard, on January 13th, another old landmark of the medical profession in the West of England passed away. Born at the "Red Lodge," Park Row, Bristol, seventy-three years ago, he took a great deal of interest in this house, and during his life enriched its collection of old Bristol valuables by several gifts. He was the son of Augustin Prichard, a prominent surgeon on the staff of the Bristol Royal Infirmary, and grandson of Dr. James Cowles Prichard, F.R.S., the ethnologist, a physician of the Infirmary from 1816 for twenty-seven years, and so a Prichard—grandfather, son and grandson—has with only a brief interval been on the staff of this noble institution for considerably over a century.

A. W. Prichard was educated at Clifton College, where he entered early in 1863, commencing in the Junior School and finishing in the VI. Form before leaving in 1869. He then joined the old Medical School, and received his further medical training at the Infirmary and University College, London ; he qualified as M.R.C.S. in 1874, and shortly afterwards became House Surgeon to the Royal Western Ophthalmic Hospital, London.

In 1876 Prichard was appointed Honorary Assistant Surgeon to the Infirmary, and two years afterwards became full Surgeon, rising to Senior Surgeon and then to Consulting Surgeon in 1906, and was a member of the staff for fifty years. His was the last appointment under the old rule that physicians and surgeons were elected subject to the condition that they should not hold office for more than twenty years.

For considerably over fifty years he worked hard for the Bristol Eye Dispensary in Orchard Street. This Charity had been founded in 1812 by John Bishop Estlin. It is not too much to say that the institution would not have been kept going but for his great-nephew's energy in the professional work, and also for the keenness with which he obtained new subscribers when funds were required, particularly for the reconstruction and equipment of the old premises and the furnishing of up-to-date Out- and In-patient Departments worthy of its traditions. Prichard was also Honorary Consulting Oculist to the Royal School of Industry of the Blind.

A. W. Prichard was in his younger days an all-round athlete, gaining his cricket colours at Clifton College ; he afterwards played for Clifton, Thornbury and the Medicals. He was also a fair Rugby football player in the early days of the formidable Bristol Medical F.C. The writer of these notes remembers many an hour's cricket practice with Arthur Prichard in the garden of Chesterfield Place in the early seventies, when his father's windows suffered severely in consequence.

Over fifty years ago he was President of the Annual Medical Dinner, preceding such well-known medicos as Dr. J. Beddoe,

Photo, F. Bromhead, Clifton

A. W. Pinchard

F.R.S., Dr. J. G. Swayne, and a host of others now long passed away. He was also President of the Bristol Medico-Chirurgical Society in 1895. An energetic volunteer officer, doing much good work with the Bristol Rifles (1st Volunteer Battalion Gloucestershire Regiment) until the Territorials were formed in 1908, when he became Officer Commanding the 3rd South Midland Field Ambulance, and also for some years Brigade Surgeon to the Portland Infantry Brigade.

When Augustin Prichard, his father, resigned the post of Surgeon to Clifton College he was appointed, and he held this post for many years. The Editor was a medical student under him, attended his lectures, and subsequently throughout the time he was Physician to Clifton College Arthur Prichard was his colleague there as well as at the Royal Infirmary, and his close friend.

He was on the staff of University College, Bristol, as Lecturer on Practical Surgery, and his pleasant manner and practical knowledge of the subject made these lectures interesting to the students. He was a member of the Ophthalmological Society, and made numerous contributions to the medical journals and societies during his long professional career.

Prichard was a quiet, well-read gentleman, always ready to lend a hand to anything that would promote the interest of the medical profession, and always very much against any idea of advertising himself; his cheery face and happy smile will be much missed by his numerous friends both old and young, and by a large circle of medical men in the West of England.

One of his hobbies was photography, and in this he excelled in the days when the amateur had largely to depend on his own initiative and experience both in taking and in developing his pictures.

The funeral service was held at the Clifton Parish Church, and was attended by a large number of his old friends and patients.

He leaves a widow, two sons, the elder being the Rev. Canon H. A. Prichard, of New York, the younger Lieut. N. Prichard in the Royal Navy, and three daughters, and fifteen grandchildren to mourn his loss. Few men have been more universally beloved than was Arthur Prichard.

The Library of the Bristol Medico-Chirurgical Society.

The following publications have been received since the publication of the List in December, 1925.

February, 1926.

Dr. D. S. Davies (1)	1 volume.
J. Wright & Sons Ltd. (2)	1 ,,
Dr. P. Watson-Williams (3)	1 ,,
Surgeon-General of the United States Army (4)	1 ,,
Joint War Committee of the British Red Cross Society (5)	1 ,,
Michell Clarke Memorial Fund (6)	5 volumes.
Munro Smith Memorial Fund (7)	4 ,,

Unbound periodicals have been received from Professor Hey Groves and Dr. Carey Coombs.

THE ONE HUNDRED AND FIFTEENTH LIST OF BOOKS.

The figures in round brackets refer to the figures after the names of the donors. The books to which no such figures are attached have either been bought from the Library Fund or received through the *Journal*.

Brockbank, E. M. .. *Incapacity or Disablement in its Medical Aspects* 1926

Cameron, S. J., and Hewitt, J. *Uterine Hæmorrhage* 1926

Crookshank, F. G. .. *Migraine and other Common Neuroses* 1926

Library

Drew, H. R.	*Malignant Diseases of the Testicle*	(6)	1925
Easterbrook, C. C.	*Mental Invalids*		1926
Ewing, J.	*Neoplastic Diseases* 2nd Ed.	(7)	1922
Geddes, G.	*Puerperal Septicæmia*		1926
Goodhart, Sir J. F., and Still, G. F.	*Diseases of Children* 12th Ed.	(7)	1925
Hornibrook, F. A.	*Physical Fitness in Middle Life*		1925
Joslin, E. P.	*Treatment of Diabetes Melitus* 3rd Ed.		1924
Lewis, T.	*Mechanism and Graphic Registration of the Heart Beat* 3rd Ed.	(7)	1925
McCrae, T	*Osler's Principles and Practice of Medicine* 10th Ed.	(6)	1925
MacFarland, J.	*Surgical Pathology*	(6)	1924
	Medical Department of the United States Army in the World War. Vol. XV.	(4)	1925
Morison, R., and Saint, C. F. M.	*An Introduction to Surgery*		1925
Pauchet, V.	*Practical Surgery.* Vols. I. and II.	(7)	1924
A Pharmacist	*Principal Drugs*		1926
Poulton, E. P.	*Taylor's Practice of Medicine* 13th Ed.	(7)	1925
Ryall, E. C.	*Operative Cystoscopy*	(6)	1925
Siemens, H. W., and Barker, L. F.	*Race Hygiene and Heredity*	(1)	1924
Steindler, A.	*Operative Orthopædics*		1925
Thomson, H. C., and Riddoch, G.	*Diseases of the Nervous System* 4th Ed.		1926
Watson-Williams, P.	*The Semon Lecture*, 1925	(3)	1925
Wright's of Bristol	*Centenary Souvenir*	(2)	1925

TRANSACTIONS, REPORTS, JOURNALS, ETC.

Annual Report of the Chief Medical Officer of the Board of Education		1925
British Journal of Surgery, January		1926
Report of the Medical Research Council, 1924-25		1925
Reports of the Joint War Committee of the British Red Cross Society, 1914-19	(5)	1921

Local Medical Notes.

EXAMINATION RESULTS.

University of Bristol.—Students of the University have recently passed the following examinations :—

M.B., Ch.B (*Part I.*). — *Final Examination:* C. Batt, W. P.. Brinckman, A. M. Critchley, T. F. Hewer (with distinction in Materia Medica, Pharmacy, Pharmacology and Therapeutics), R. Jackson, J. E. Martin, J. R. E. Sansom, M. Srisvasti, D. M. H. Tripp (with distinction in Materia Medica, Pharmacy, Pharmacology and Therapeutics), E. R. Wide. *Part II.* (*Completing Examination*) : (*Honours*) C. B. Perry (with distinction in Obstetrics). *Pass :* G. W. R. Bishop, R. V. Cooke, F. S. Dymond, F. R. Gedye (with distinction in Pathology, Forensic Medicine and Toxicology), A. P. Gorham, T. P. Lalonde, G. M. Minifie, L. B. Phillips, A. S. Prowse. *In Group II. only :* G. L. Feneley, C. France-Hayhurst.

Ch.M.—*In Gynæcology :* H. L. Shepherd.

B.D.S.—*3rd Examination :* E. C. Browne.

Diploma in Dental Surgery. — *Final Examination :* R. Lonnon. *2nd Professional Examination :* P. J. Whiteman, A. E. Wilkins. *Pass* (*in Dental Metallurgy and Dental Mechanics*) (*Completing Examination*) : J. H. Edwards. *In Dental Mechanics* (*Completing Examination*) : D. M. Cox. *In Dental Materia Medica* (*Completing Examination*) : P. H. Slater. *In Dental Mechanics and Dental Metallurgy only :* E. J. Tanner, G. W. Vowles. *In Dental Metallurgy only :* A. L. Gilchrist.

Conjoint Board.—M.R.C.S., L.R.C.P. (*Completing Examination*) : R. V. Cooke, A. P. Gorham, T. P. Lalonde.

APPOINTMENTS.

Dr. J. A. Nixon has been appointed Honorary Consulting Physician and Dr. R. S. S. Statham Honorary Obstetric Physician to the Clifton Dispensary.

Bristol Medico-Chirurgical Society.

President.

T. CARWARDINE, M.S. Lond.

President-Elect.

A. L. FLEMMING, M.B., B.Ch.

Committee.

Ex-Officio

- J. ODERY SYMES. M.D. Lond. (Retiring President).
- P. WATSON-WILLIAMS, M.D. Lond. (Editor of *Journal*).
- C. K. RUDGE (Hon. Librarian).
- A. L. FLEMMING, M.B., Ch.B. Brist. (Editorial Secretary).

Elected.

- F. LACE
- J. A. NIXON, C.M.G., B.A., M.D. Cantab.

} Ex-Presidents.

- D. C. RAYNER.
- C. FERRIER WALTERS.
- E. W. HEY GROVES, M.D., M.S. Lond.
- A. J. WRIGHT, M.B., B.S. Lond.
- H. L. ORMEROD, M.D. (R.U.I.).
- W. VINCENT WOOD, M.C., B.A. Cantab.

Honorary Secretary.

S. V. STOCK, M.B., B.S. Lond., M.B., B.Ch. Brist.

Medical Practitioners wishing to join the Society are requested to communicate with the Hon. Secretary, Mr. S. V. STOCK, 1 Mortimer Road, Clifton. The Annual Subscription is £1 11s. 6d.

Extracts from Journal By-laws.

4.—The *Journal* shall be delivered free to Subscribers and also to Members of the Society whose subscriptions are not in arrear.

6.—The Annual Subscription to the *Journal* is 10/6.

Communications intended for insertion in the *Journal* should be sent to the Editor, Dr. P. WATSON-WILLIAMS, 2 Rodney Place, Clifton, Bristol.

Books for Review and Exchange Journals should be sent to the Assistant-Editor, *Bristol Medico-Chirurgical Journal*, Medical Library, The University, Bristol.

Communications referring to the delivery of the *Journal* should be sent to the Editorial Secretary, A. L. Flemming, 48 Pembroke Road, Clifton, Bristol, to whom Subscriptions are to be paid *in advance*.

Cases for Binding Vols. I—XLII are now ready, and may be obtained, price 1/9 each (postage extra), upon application to J. W. ARROWSMITH LTD., Quay Street, Bristol; or the *Journal* will be bound, including Case, for 7/- per volume.

Bristol Medico-Chirurgical Society.

PAST PRESIDENTS.

1874—75. FREDERICK BRITTAN, M.D., B.A. Dub.
1875—76. ROBERT WILLIAM COE.
1876—77. SAMUEL MARTYN, M.D. Ed.
1877—78. AUGUSTIN PRICHARD, M.D. Berlin.
1878—79. HENRY EDWARD FRIPP, M.D. Würzburg.
1879—80. WILLIAM MICHELL CLARKE.
1880—81. JOSEPH GRIFFITHS SWAYNE, M.D. Lond.
1881—82. EDWARD LONG FOX, M.D. Oxon.
1882—83. JAMES GEORGE DAVEY, M.D. St. And.
1883—84. WILLIAM JOHNSTONE FYFFE, M.D., B.A. Dub.
1884—85. GEORGE FORSTER BURDER, M.D. Aberd.
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